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DOT HS 807 239
Test Report

November 1987

Vehicle Barrier Impact Testing with Hybrid III Dummies in a 1987 Toyota Camry 4-Door Sedan

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Technical Report Documentation Page

1. Report No. DOT HS 807 239	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle: VEHICLE BARRIER IMPACT TESTING WITH HYBRID III DUMMIES IN A 1987 TOYOTA CAMRY 4-DOOR SEDAN		5. Report Date: NOVEMBER 1987
		6. Performing Organization Code
7. Author(s): J.W. Sankey, Project Engineer, TRC		8. Performing Organization Report No. 871103
9. Performing Organization Name and Address: Vehicle Research & Test Center, U.S. Rt. 33, Logan County, East Liberty, Ohio 43319		10. Work Unit No. (TRAIS)
		11. Contract or Grant No. DTNH22-85-C-08123
12. Sponsoring Agency Name and Address: U.S. Department of Transportation, National Highway Traffic Safety Administration, 400 Seventh St., S.W., Washington, DC 20590		13. Type of Report and Period Covered: TEST REPORT, November, 1987
		14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

A 30 mph flat frontal barrier impact test was conducted on a 1987 Toyota Camry 4-door sedan at the Transportation Research Center of Ohio on November 3, 1987, using Hybrid III driver and passenger dummies.

The barrier impact velocity was 29.6 mph.

The ambient temperature was 72°F.

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17. Key Words: Occupant Response Hybrid III Dummy	18. Distribution Statement: Available from: National Technical Information Service, Springfield, Virginia 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	114	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

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SECTION 1.0

PURPOSE AND INTRODUCTION

PURPOSE

This 30 mph frontal barrier impact test is part of a program to document the response of Hybrid III occupant dummies conducted for the National Highway Traffic Safety Administration (NHTSA) by the Transportation Research Center of Ohio (TRC) under Contract No. DTNH22-85-C-06123. The purpose of this test was to determine Hybrid III dummy response in the subject vehicle, a 1987 Toyota Camry 4-door sedan. The test was conducted in accordance with the FMVSS 208 portions of the Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-06 dated May 15, 1987, except for the use of Hybrid III dummies in place of Part 572 B dummies.

TEST SUMMARY

The 1987 Toyota Camry 4-door sedan was equipped with a 2.0 liter transverse engine, automatic transmission, power steering, and power brakes. The test weight of the vehicle was 3346 pounds. The Head Injury Criteria (HIC) calculations were less than 1000, the resultant accelerations of the thorax did not exceed 60 g's, and the compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Hybrid III dummies seated in the driver's and right front passenger's seats.

Two Hybrid III, 50th percentile, adult male anthropomorphic test devices (ATDs) were seated in the front outboard designated seating positions. The dummies were positioned according to the dummy placement procedures specified in FMVSS 208 Notice 45.

Both ATDs were instrumented with head and chest triaxial accelerometers oriented to measure accelerations in the longitudinal, lateral, and vertical directions, a chest displacement potentiometer, right and left femur load cells, and neck load cells oriented to measure longitudinal and vertical forces and moment about the lateral axis.

The vehicle was instrumented with seven longitudinal axis accelerometers. Seat belt load cells were installed on each occupant's passive seatbelt.

The crash event was recorded by one (1) real time panning camera and fourteen (14) high speed motion picture cameras operating at approximately 500 frames per second.

The thirty-three (33) channels of data were multiplexed and recorded on a 14-track tape drive. The data was digitally sampled at 8000 samples per second digitally processed per sections 12.8 and 12.9 of the laboratory procedure.

The vehicle was impacted into the rigid, flat frontal barrier at the Transportation Research Center of Ohio on November 3, 1987. The test vehicle's impact speed was 29.6 mph. The vehicle sustained 16.5 inches of static crush.

The camera information is presented in Section 3.0. Appendix A contains the still photographic prints. Appendix B contains the vehicle and dummy data plots. Appendix C contains the pre-test and post-test dummy performance calibrations.

CRASH TEST SUMMARY

TEST NO.: 871103

DATE: November 3, 1987 TIME: 1348 TEMP: 72°F

VEHICLE: 1987 Toyota Camry 4-door sedan

TEST WEIGHT (LBS): 3346

IMPACT ANGLE (DEG)*: 0

IMPACT VELOCITY (MPH)**: PRIMARY = 29.6 SECONDARY = 29.6

MAX CRUSH (IN) STATIC: 16.5

REBOUND (IN): 30.9

DUMMIES:	Driver	Passenger
TYPE:	Hybrid III	Hybrid III
LOCATION:	Front Left	Front Right
RESTRAINT:	Two-point passive belt	Two-point passive belt

NUMBER OF DATA CHANNELS: 33

NUMBER OF HIGH SPEED CAMERAS: 14 and 1 real-time camera

*With respect to tow track centerline.
**Speed trap measurement (± .05 mph accuracy).

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Toyota Motor Company

MAKE/MODEL: Toyota Camry VIN: JT2SV21E5H3127006

BODY STYLE: 4-door sedan MODEL YEAR: 1987

COLOR: Brown

ENGINE DATA: TYPE: Transverse CYLINDERS: 4 DISPLACEMENT: 2.0 liter

_X_ Gas, ____ DIESEL, _____ TURBOCHARGE

TRANSMISSION DATA: _____ SPEED, _____ MANUAL, _X_ AUTOMATIC, _X_ FWD _ RWD

DATA VEHICLE RECEIVED: 10/27/87 ODOMETER READING: 6730

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING Yes
POWER BRAKES Yes
POWER SEATS No
POWER WINDOWS No
TINTED GLASS No
RADIO Yes
CLOCK Yes
OTHER None

AUTOMATIC TRANSMISSION Yes
AUTOMATIC SPEED CONTROL Yes
TILTING STEERING WHEEL Yes
TELESCOPING STEERING WHEEL No
AIR CONDITIONING Yes
ANTI-SKID BRAKE No
REAR WINDOW DEFROSTER Yes

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Toyota Motor Company

DATE OF MANUFACTURER: 4/87

GVWR: 3880 LBS.

GAWR: FRONT 2227 LBS., REAR 2227 LBS.

TEST VEHICLE INFORMATION, CONTINUED

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 30 psi; REAR 30 psi

RECOMMENDED TIRE SIZE: 185/70SR14 LOAD RANGE X B, C, D

TIRES ON VEHICLE (MFGR. & LINE, SIZE): Dunlap M & S 185/70SR14

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

VEHICLE CAPACITY: TYPES OF SEATS: Front bucket
Rear bench

TYPE OF FRONT SEAT BACKS Manual Adjustable

NUMBER OF OCCUPANTS 2 FRONT 3 REAR 5 TOTAL

CARGO LOAD 150 LBS. TOTAL 900 LBS.

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	892 lbs.	RIGHT REAR	536 lbs.
LEFT FRONT	898 lbs.	LEFT REAR	554 lbs.

TOTAL FRONT WEIGHT 1,790 lbs. (62.2% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1,090 lbs. (37.8% OF TOTAL VEHICLE WEIGHT)

TOTAL DELIVERED WEIGHT 2,880 lbs.

CALCULATION FOR TARGET TEST WEIGHT:

RCLW + RATED CARGO AND LUGGAGE WEIGHT

UDW = UNLOADED DELIVERED WEIGHT (2880 LBS)

VCW = VEHICLE CAPACITY WEIGHT (900 LBS)

DSC = DESIGNATED SEATING CAPACITY (5)

RCLW = VCW - (150) (DCS) = (150 LBS)

TARGET TEST WEIGHT = UDW + RCLW + (2 DUMMIES X 167 LBS/DUMMY)

= 2880 + 150 + 334 LBS

TARGET TEST WEIGHT = 3364 LBS

TEST VEHICLE INFORMATION, CONTINUED

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 132 LBS. CARGO:

RIGHT FRONT	944 lbs.	RIGHT REAR	705 lbs.
LEFT FRONT	978 lbs.	LEFT REAR	719 lbs.

TOTAL FRONT WEIGHT 1,922 lbs. (57.4% OF TOTAL VEHICLE WEIGHT)

TOTAL REAR WEIGHT 1,424 lbs. (42.6% OF TOTAL VEHICLE WEIGHT)

TOTAL TEST WEIGHT 3,346 lbs. (0.5% UNDER TARGET WEIGHT)

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 lbs.

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES): NONE

DELIVERED ATTITUDE:	LF 26.9;	RF 27.0;	LR 26.8;	RR 27.2
PRE-TEST ATTITUDE:	LF 25.5;	RF 24.9;	LR 24.4;	RR 24.7
POST-TEST ATTITUDE:	LF 25.9;	RF 26.4;	LR 24.1;	RR 24.3

WHEELBASE: 102.8 INCHES

MAX. WIDTH: 67.0 INCHES

CG = 43.7 INCHES REARWARD OF FRONT WHEEL CENTERLINE

TEST VEHICLE INFORMATION, CONTINUED

TEST CONDITIONS

TEST NUMBER: 871103

DATE OF TEST: 11/03/87 TIME OF TEST: 1348

TYPE OF TEST: Frontal Barrier Impact IMPACT ANGLE: 0°

AMBIENT TEMPERATURE AT IMPACT AREA: 72°F

TEMPERATURE IN OCCUPANT COMPARTMENT: 73°F

DRIVER TEMPERATURE: 72°F

PASSENGER TEMPERATURE: 74°F

IMPACT VELOCITY: PRIMARY = 29.6 MPH SECONDARY = 29.6 MPH

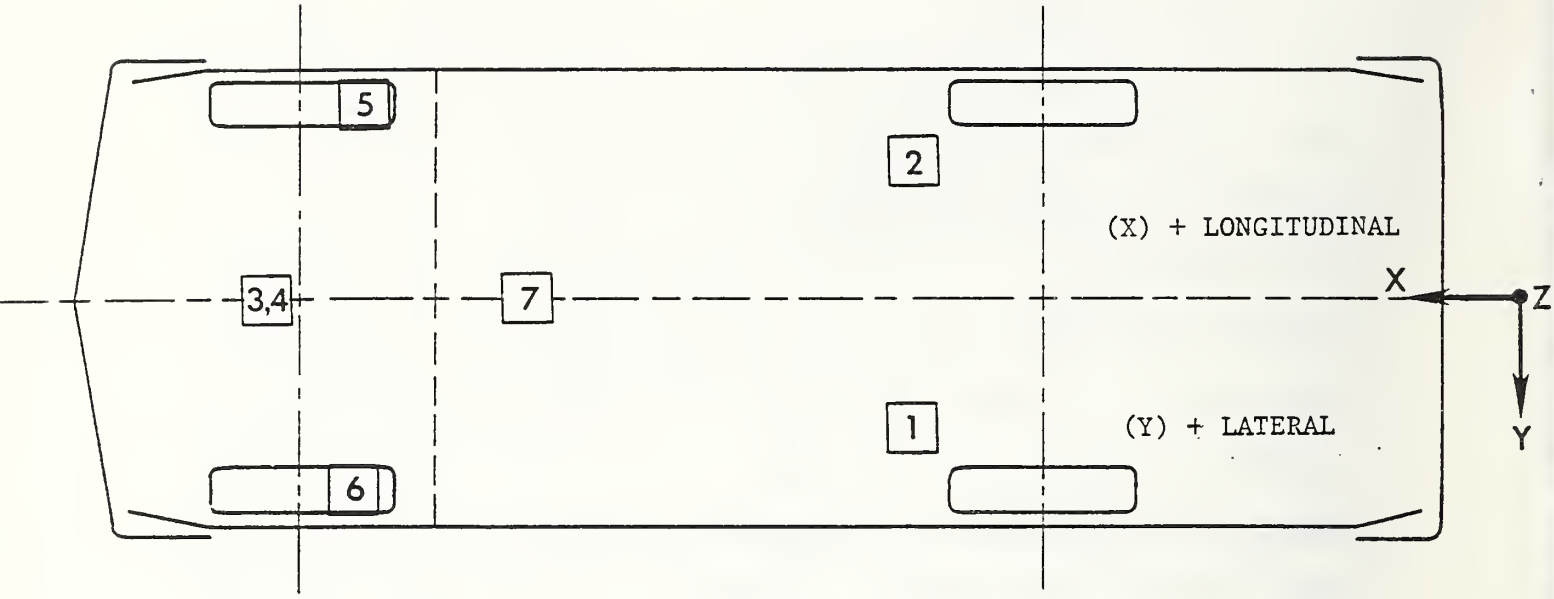
(SPECIFIED RANGE = 28.9 to 29.9 MPH)

VEHICLE REBOUND AND CRUSH (ALL DIMENSIONS IN INCHES)

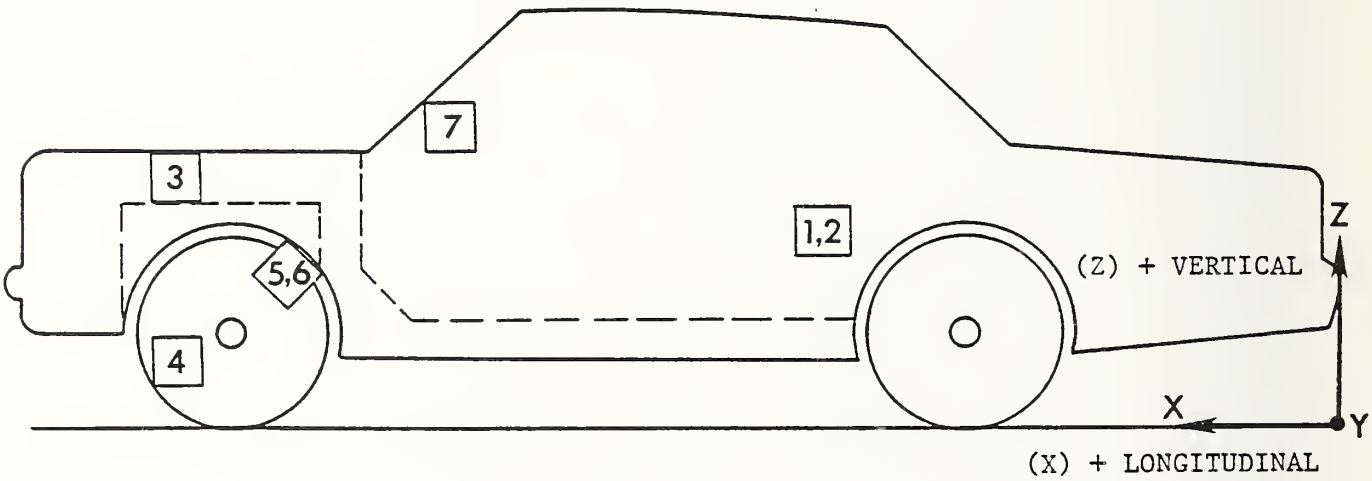
OVERALL LENGTH OF TEST VEHICLE:	PRE-TEST:	L 177.6	;C 182.6	;R 177.6
	POST-TEST:	L 163.2	;C 166.1	;R 164.5
	TOTAL CRUSH:	L 14.4	;C 16.5	;R 13.1

FOR FRONTAL IMPACT, DISTANCE FROM FRONT OF TEST VEHICLE TO BARRIER AFTER IMPACT: L: 32.0 ;C: 29.4 ;R: 31.2 :AVG: 30.9

VEHICLE ACCELEROMETER LOCATIONS



TOP VIEW



SIDE VIEW

TEST NUMBER 871103

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

No.	LOCATION		X*	Y*	Z*	POSITIVE DIRECTION MAX G	POSITIVE DIRECTION MSEC	NEGATIVE DIRECTION MAX G	NEGATIVE DIRECTION MSEC
1	REAR SEAT CROSSMEMBER	PRE	72.5	15.8	16.6				
	AT LEFT SIDE	POST	71.8	16.0	16.4				
	LONGITUDINAL					2.7	128.8	27.2	24.8
2	REAR SEAT CROSSMEMBER	PRE	72.5	-15.8	16.5				
	AT RIGHT SIDE	POST	71.8	-16.0	16.5				
	LONGITUDINAL					2.2	129.5	27.8	54.1
3	TOP OF ENGINE BLOCK	PRE	152.0	4.3	28.6				
		POST	147.1	4.5	28.8				
	LONGITUDINAL					44.4	44.9	111.9	35.5
4	BOTTOM OF ENGINE	PRE	155.1	-7.9	6.4				
		POST	150.5	-10.0	8.6				
	LONGITUDINAL					28.9	48.5	117.8	27.9
5	BRAKE CALIPER	PRE	149.4	-25.4	11.5				
	AT RIGHT SIDE	POST	144.5	-23.5	11.6				
	LONGITUDINAL					35.3	56.3	71.1	31.9
6	BRAKE CALIPER	PRE	149.4	25.4	11.3				
	AT LEFT SIDE	POST	143.8	24.0	9.2				
	LONGITUDINAL					71.3	52.8	75.0	37.5
7	DASH PANEL	PRE	121.8	-1.2	36.0				
		POST	122.7	-1.0	36.8				
	LONGITUDINAL					6.1	34.6	70.3	66.6

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: FORWARD FROM REAR BUMPER
Y: LEFT FROM VEHICLE CENTERLINE
Z: UPWARD FROM GROUND LEVEL

ACCIDENT INVESTIGATION DIVISION DATA

FOR 30 MPH FRONTAL BARRIER IMPACT

VEHICLE MAKE/MODEL/BODY STYLE: Toyota Camry 4-Door Sedan

VEH. NHTSA NO.: _____; VIN: JT2SV21E5H3127006

MODEL YEAR: 1987; BUILD DATE: 4/87; TEST DATE 11/3/87

VEH. SIZE CATEGORY: Compact; TEST WEIGHT: 3346

VEH. WHEELBASE: 102.8 MAXIMUM WIDTH: 67.0 FRONT OVERHANG: 36.6

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: 12FDEW2

F (Frontal)

CRUSH DEPTH DIMENSIONS:

C1 = 14.4 inches

C2 = 15.0 inches

C3 = 16.3 inches

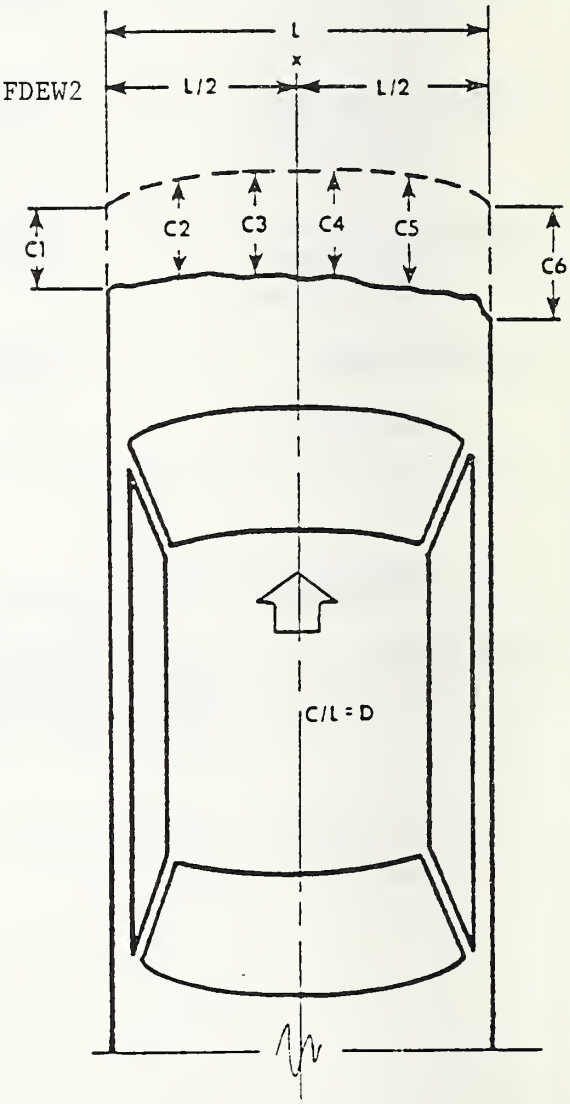
C4 = 16.1 inches

C5 = 14.9 inches

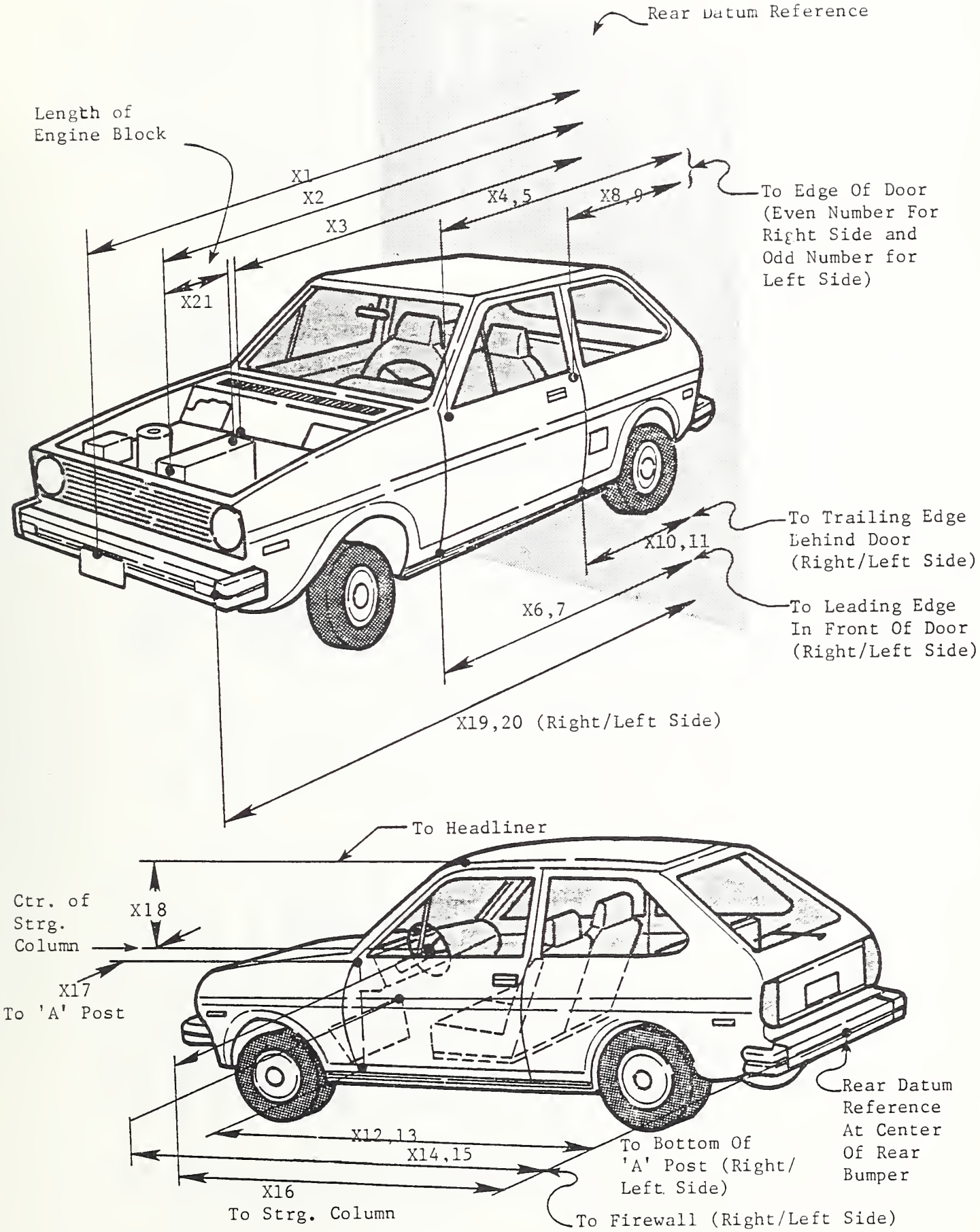
C6 = 13.1 inches

MIDPOINT OF DAMAGE: D = Vehicle Centerline (Longitudinal)

LENGTH OF DAMAGED REGION: L = 59.0 inches



PRE-TEST AND POST-TEST MEASUREMENT POINTS

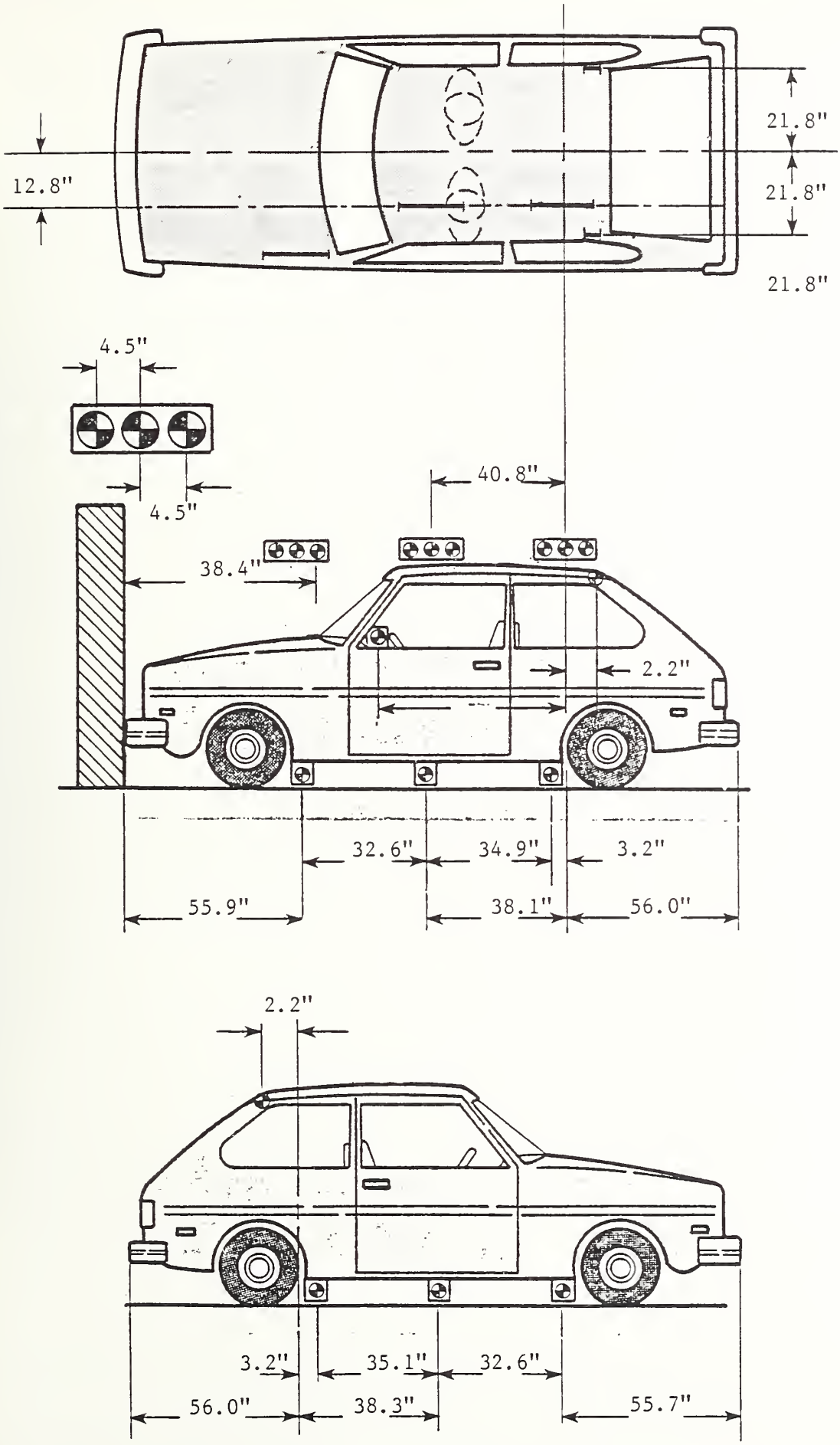


IMPACTED VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL Toyota Camry TEST NUMBER 871103

NO.	TYPE OF MEASUREMENT	DIMENSIONS IN INCHES PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	182.6	166.1	16.5
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	150.2	146.1	4.1
X3	REAR SURFACE OF VEHICLE TO FIREWALL	135.5	133.4	2.1
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	123.8	124.2	-0.4
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	123.8	123.8	0.0
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	122.9	123.5	-0.6
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	123.4	123.0	0.4
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	83.8	84.2	-0.4
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	83.8	84.0	-0.2
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	83.5	84.0	-0.5
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	83.8	83.5	0.3
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	123.6	123.9	-0.3
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	123.8	123.4	0.4
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	134.3	134.5	-0.2
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	134.3	133.6	0.7
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	108.0	108.5	-0.5
X17	CENTER OF STEERING COLUMN TO "A" POST	15.5	16.0	-0.5
X18	CENTER OF STEERING COLUMN TO HEADLINING	18.0	17.1	0.9
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	177.6	164.5	13.1
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	177.6	163.2	14.4
X21	LENGTH OF ENGINE BLOCK	17.6	17.6	0.0

VEHICLE TARGET LOCATIONS



SECTION 2.0

SUMMARY OF TEST RESULTS

DATA SUMMARY

The driver's Head Injury Criteria, HIC, was 619. The driver's maximum chest deceleration over three milliseconds was 45.6 g. The driver's right and left compressive femur loads were 1540.7 pounds and 1538.8 pounds, respectively. The driver's maximum chest displacement was 1.7 inches.

The right front passenger's Head Injury Criteria, HIC, was 712. The right front passenger's maximum chest deceleration over three milliseconds was 40.7 g. The right front passenger's right and left compressive femur loads were 1383.3 pounds and 1267.4 pounds, respectively. The right front passenger's maximum chest displacement was 2.2 inches.

The vehicle's restraint system met the comfort and convenience requirements of FMVSS 208.

DUMMY DATA SUMMARY

	DRIVER DUMMY SN: 45				PASSENGER DUMMY SN: 143			
	POSITIVE DIRECTION*		NEGATIVE DIRECTION**		POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX	TIME	MAX	TIME	MAX	TIME	MAX	TIME
HEAD ACCELERATION (g)								
LONGITUDINAL	17.7	208.8	36.7	101.0	27.5	190.6	35.8	97.0
LATERAL	4.6	260.1	10.5	96.9	6.8	238.0	7.0	86.2
VERTICAL	3.3	16.4	54.6	72.6	4.9	314.2	60.3	81.5
RESULTANT	64.1	72.6			68.3	81.5		
HIC	619 from 65.1 to 101.1 msec				712 from 61.6 to 97.6 msec			
NECK LOADS (lbs)								
SHEAR (X)	414.4	99.9	37.8	201.9	263.0	83.6	53.9	191.5
AXIAL (Z)	529.5	77.5	68.7	239.0	584.8	83.8	74.4	218.8
NECK MOMENTS (lb-ft)								
ABOUT LATERAL	60.2	99.9	24.7	238.2	73.0	96.6	20.0	66.0
CHEST ACCELERATION (g)								
LONGITUDINAL	4.4	236.9	45.5	64.9	7.5	158.2	41.4	64.1
LATERAL	4.0	60.0	15.7	79.4	3.9	42.5	6.6	75.2
VERTICAL	9.9	63.9	3.6	261.4	8.8	48.6	4.4	99.0
RESULTANT	46.6	64.8			41.6	64.1		
3 MSEC CLIP	45.6				40.7			
CHEST DISPLACEMENT (in)								
	1.7	82.9	0.0	0.0	2.2	77.8	0.0	9.9
FEMUR LOADS (lbs)								
LEFT	72.3	211.5	1538.8	62.9	105.4	109.5	1267.4	61.2
RIGHT	67.5	37.9	1540.7	59.8	69.8	108.1	1383.3	56.9

*LONGITUDINAL:	FORWARD	**LONGITUDINAL:	REARWARD
LATERAL:	LEFTWARD	LATERAL:	RIGHTWARD
VERTICAL:	UPWARD	VERTICAL:	DOWNWARD
DISPLACEMENT:	INWARD	DISPLACEMENT:	OUTWARD
FORCE:	TENSION	FORCE:	COMPRESSION

SEAT BELT DATA SUMMARY

LOCATION	SEAT BELT TENSION MAX. LBS.	TIME,MSEC.
DRIVER'S PASSIVE BELT	2115.2	70.1
PASSENGER'S PASSIVE BELT	1819.3	72.1

DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward as the chest was restrained by the two-point passive belt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The dummy came to rest seated upright in the driver's seat, restrained by the two-point passive seat belt.

PASSENGER DUMMY

Upon impact, the passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward as the chest was restrained by the two-point passive belt. The dummy's head rotated rearward into the right side of the head restraint as the dummy rebounded into the seatback. The dummy came to rest seated in the passenger's seat, with the buttocks slightly forward on the seat, restrained by the two-point passive belt.

VISIBLE DUMMY CONTACT POINTS:

	DRIVER	PASSENGER
Head	None	None
Chest	None	None
Abdomen	None	None
Left Knee	Instrument panel	Instrument panel
Right Knee	Instrument panel	Instrument panel

DOOR OPENING:

	LEFT	RIGHT
Front	Easy	Easy
Rear	Easy	Easy

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	Easy	Easy
Rear	NA	NA

GLAZING DAMAGE: The windshield was cracked upon impact.

OTHER NOTABLE IMPACT EFFECTS:

DUMMY POSITIONING DATA FOR
30 MPH FRONTAL BARRIER IMPACT TEST

PRE-IMPACT DATA:

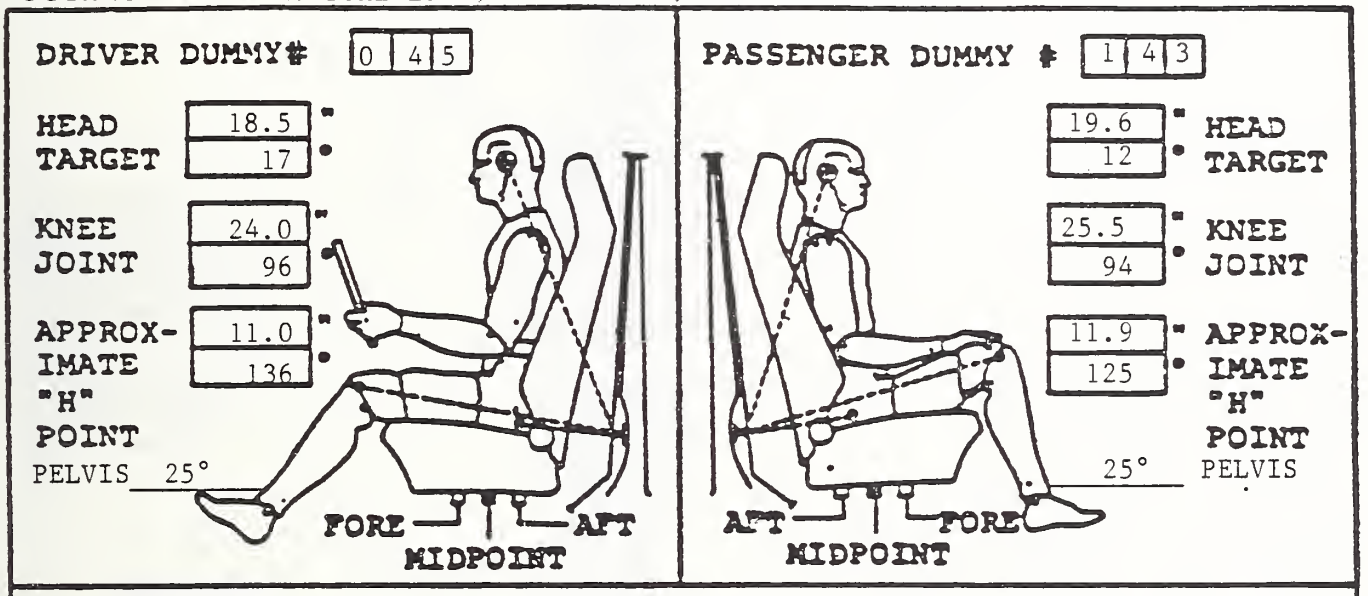
Make/Model: Toyota/Camry
Body Style: 4-door sedan **Model Year:** 1987
NHTSA No.: _____ **Color:** Brown

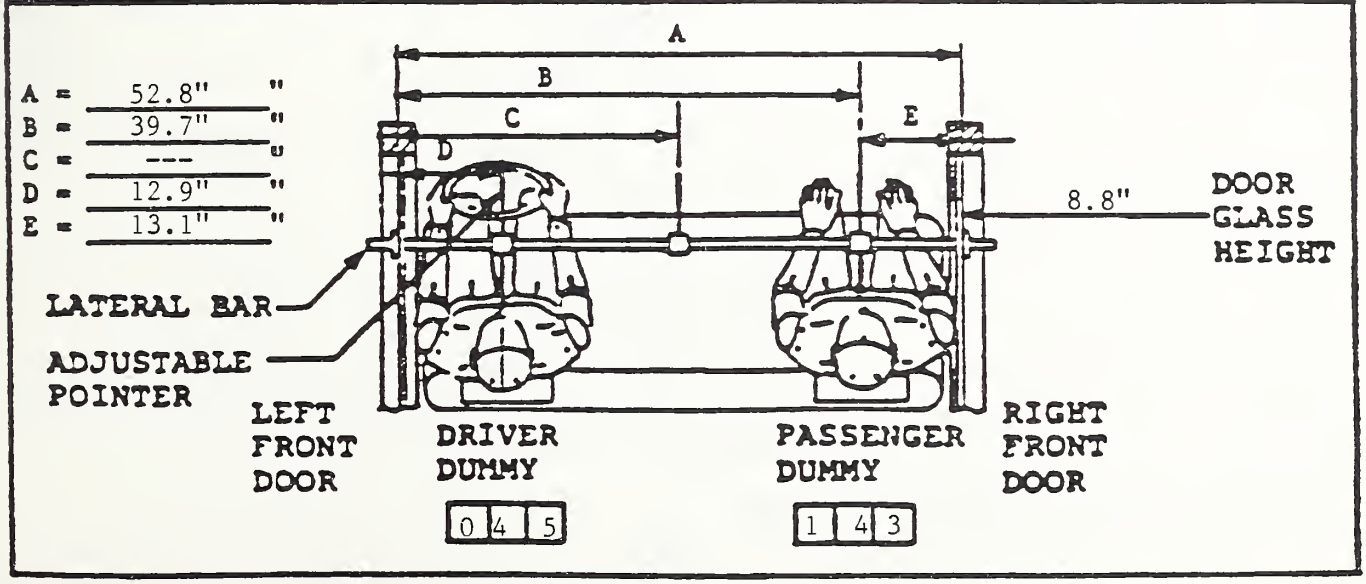
DATA FROM CERTIFICATION LABEL:

Vehicle Manufacturer: Toyota Motor Company
Date of Manufacture: 4/87 ; **VIN:** JT2SV21E5H3127006
GVWR: 3880 lb; **GAWR: Front =** 2227 lb; **Rear =** 2227 lb

POST-IMPACT DATA:

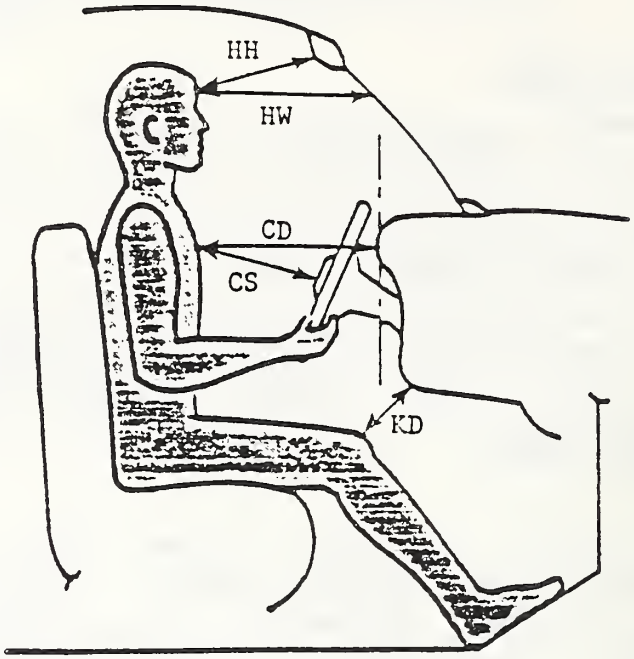
Date of Test: 11/13/87 **Time:** 1348 **Temperature** 72 °F
Required Impact Velocity Range: 28.9 to 29.9 mph
Impact Velocity: Primary = 29.6 mph **Secondary =** 29.6 mph
Seat Type: Bucket front **Adjuster Type:** Manual
Bucket Seat Back Type: Adjustable
Technicians: R. Benavides, R. Branham, S. Ericksen



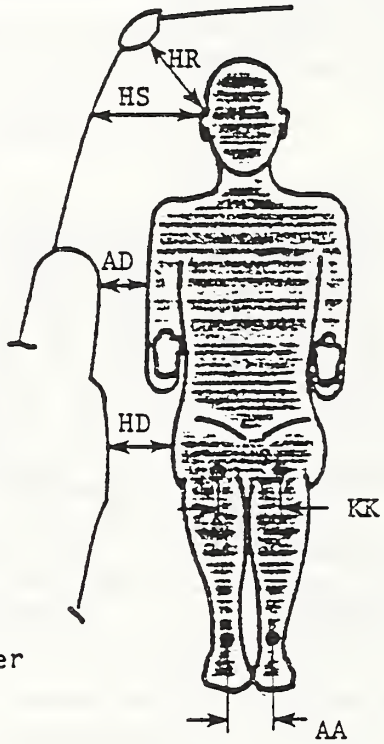


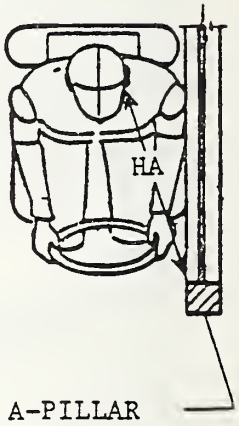
DUMMY IN-VEHICLE POSITION RECORDING SHEET

	DRIVER 45	PASSENGER 143
HH	12.2	11.1
HW	18.5	19.2
CD	21.2	19.9
CS	13.1	NA
KDL	5.2	4.4
KDR	5.3	4.0
TA	13°	15°
SA	24°	24°
HA	15.8	14.5



	DRIVER 45	PASSENGER 143
HR	6.4	6.0
HS	9.8	10.1
AD	3.8	4.2
HD	6.8	6.9
KK	8.8	8.5
AA	12.0	10.5





Knee outer bolt head to outer bolt head spacing:
Driver = 10.6
Passenger = 10.6

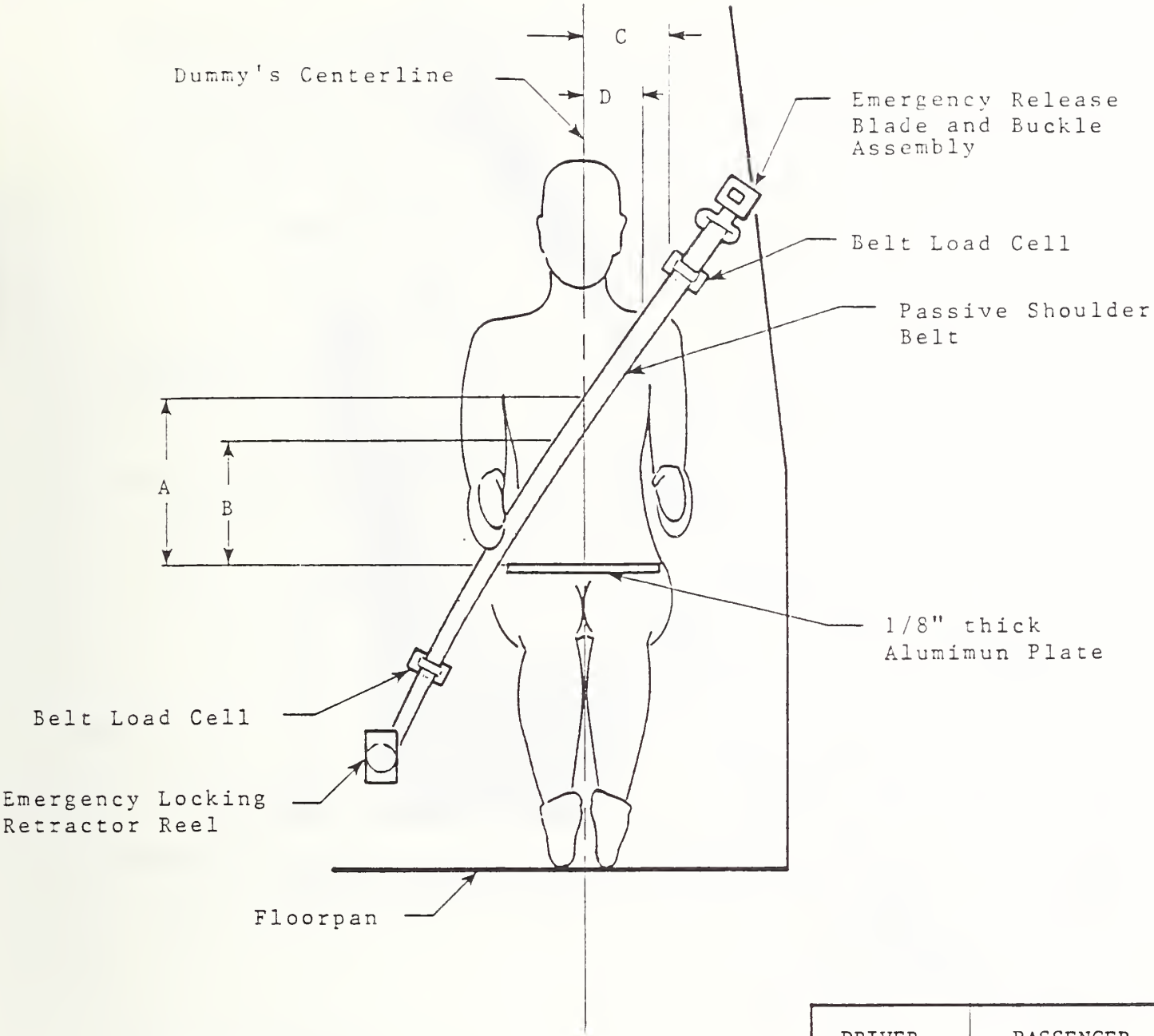
HH = Head to Windshield Header
HW = Head to Windshield
CD = Chest to Dash
CS = Chest to Steering Wheel
KD = Knee to Dash
TA = Torso Angle
SA = Seat Back Angle

HR = Head to Side Roof
HS = Head to Side Window
AD = Arm to Door
HD = Hip to Door
KK = Knee to Knee
AA = Ankle to Ankle
HA = Head to A Pillar

Torso and seat back angles are relative to vertical.

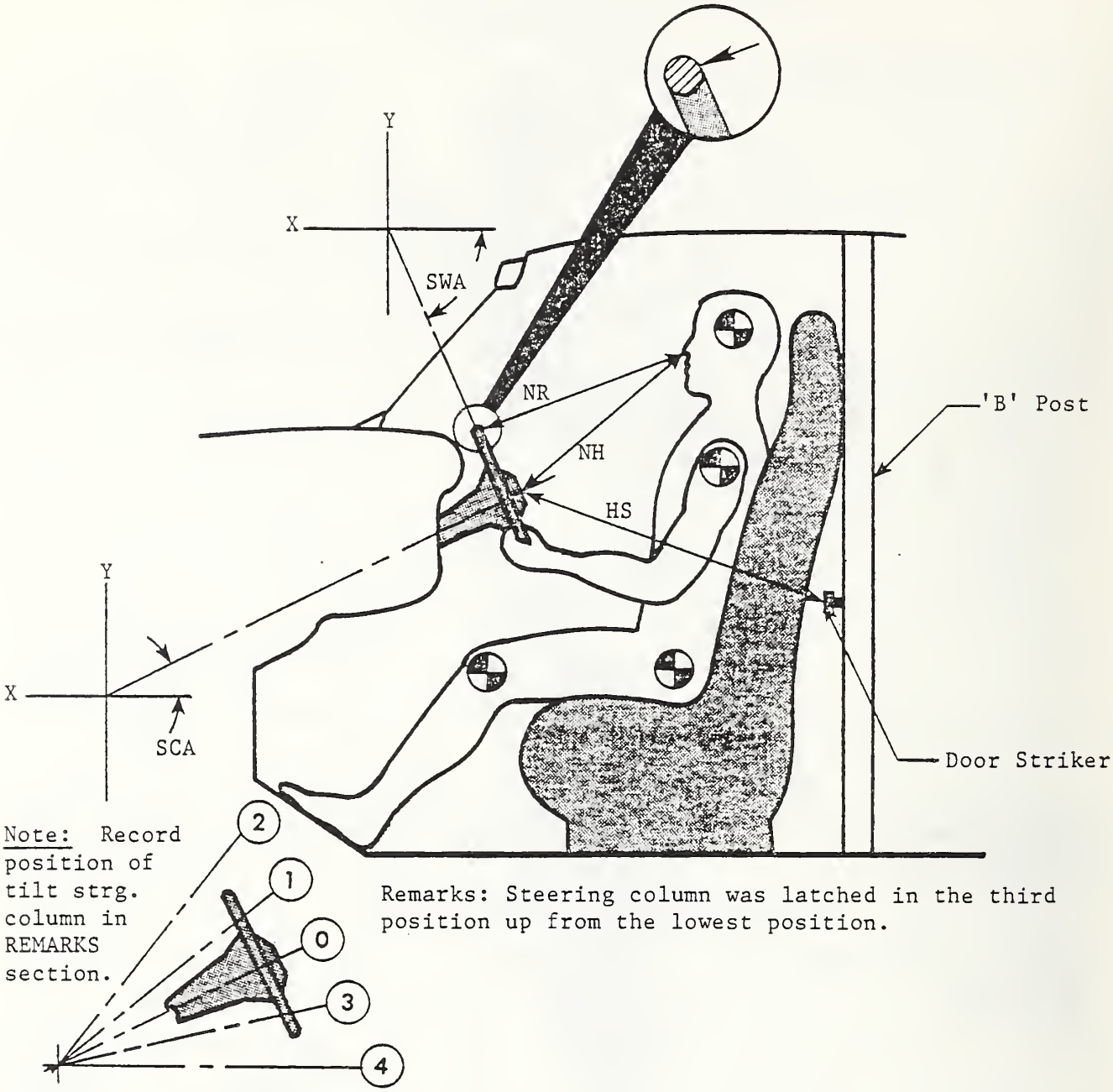
ALL DISTANCE MEASUREMENTS IN INCHES

SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
A - Top surface of alum. plate to belt upper edge (in)	13.0	14.0
B - Top surface of alum. plate to belt lower edge (in)	10.0	10.5
C - Dummy centerline to outer edge of belt at chest flesh top (in)	2.5	3.5
D - Dummy centerline to inner edge of belt at chest flesh top (in)	0.5	1.0
SHOULDER BELT TENSION (lbs)	NA	NA

DRIVER DUMMY TO STEERING COLUMN/WHEEL ASSY. REFERENCE DIMENSIONS



Note: Record position of tilt strg. column in REMARKS section.

Remarks: Steering column was latched in the third position up from the lowest position.

	MEASUREMENTS
NR - Distance from tip of dummy's nose to top rear surface of steering wheel rim.	16.2
NH - Distance from tip of dummy's nose to center of steering column hub.	16.1
HS - Distance from center of steering column hub to the forward surface of the door lock striker pin.	22.8
SCA - Angle of steering column relative to the horizontal X axis.	20°
SWA - Angle of steering wheel relative to the horizontal X axis.	75°

FMVSS 208 COMFORT AND CONVENIENCE DATA

VEHICLE VIN NO.: JT2SV21E5H3127006

MAKE: Toyota MODEL: Camry

VEHICLE BUILD DATE: 4/87 VEHICLE TYPE 4 door sedan

FRONT OUTBOARD SEATING POSITIONS SEAT BELT TYPE:

(check one): X Automatic belts

_____ Type 2 lap/shoulder belts

_____ Other

CONVENIENCE HOOKS: NA, vehicle's restraint system did not include convenience hooks.

WEBBING TENSION - RELIEVING DEVICE:

DO OUTBOARD SEATING POSITION BELTS HAVE TENSION - RELIEVING DEVICES?

No

MAXIMUM SLACK RECOMMENDED IN OWNERS MANUAL: NA INCHES

DOES OWNER'S MANUAL WARN THAT INTRODUCING SLACK BEYOND THE AMOUNT SPECIFIED CAN SIGNIFICANTLY REDUCE THE EFFECTIVENESS OF THE SHOULDER BELT?

NA

IF NO, EXPLAIN

AUTOMATIC BELTS: IS TENSION - RELIEVING DEVICE CANCELLED EACH TIME THE ADJACENT DOOR IS OPENED? NA

IF NO, EXPLAIN:

BELT CONTACT FORCE:

FOR BELTS WITHOUT TENSION-RELIEVING DEVICES: BELT CONTACT FORCE:

0.2 POUNDS

LATCHPLATE ACCESS: NA

RETRACTION: NA

ACCESSIBILITY: NA

LATCH MECHANISM: NA

FMVSS NO. 208 - SEAT BELT WARNING SYSTEM DATA

WITH OCCUPANT IN DRIVER'S POSITION AND LAP BELT IN STOWED POSITION AND IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal = 6 sec.

Duration of reminder light operation = 6 sec.

WITH OCCUPANT IN DRIVER'S POSITION AND LAP BELT IN USE AND THE IGNITION SWITCH PLACED IN "START/ON" POSITION:

Duration of audible warning signal - 3 sec.

(Note: audible warning should not operate)

Duration of reminder light operation = 6 sec.

Wording of visual warning:

Fasten Seat Belt _____

Fasten Belt X

Symbol 101-80 X

FMVSS NO. 208 - LABELING AND DRIVER'S MANUAL DATA

DESCRIBE LOCATION OF LABEL WHICH DESCRIBES MANUFACTURER's MAINTENANCE OR REPLACEMENT SCHEDULE FOR CRASH-DEPLOYED OCCUPANT PROTECTION SYSTEM: NA, vehicle did not contain a crash-deployed occupant protection system.

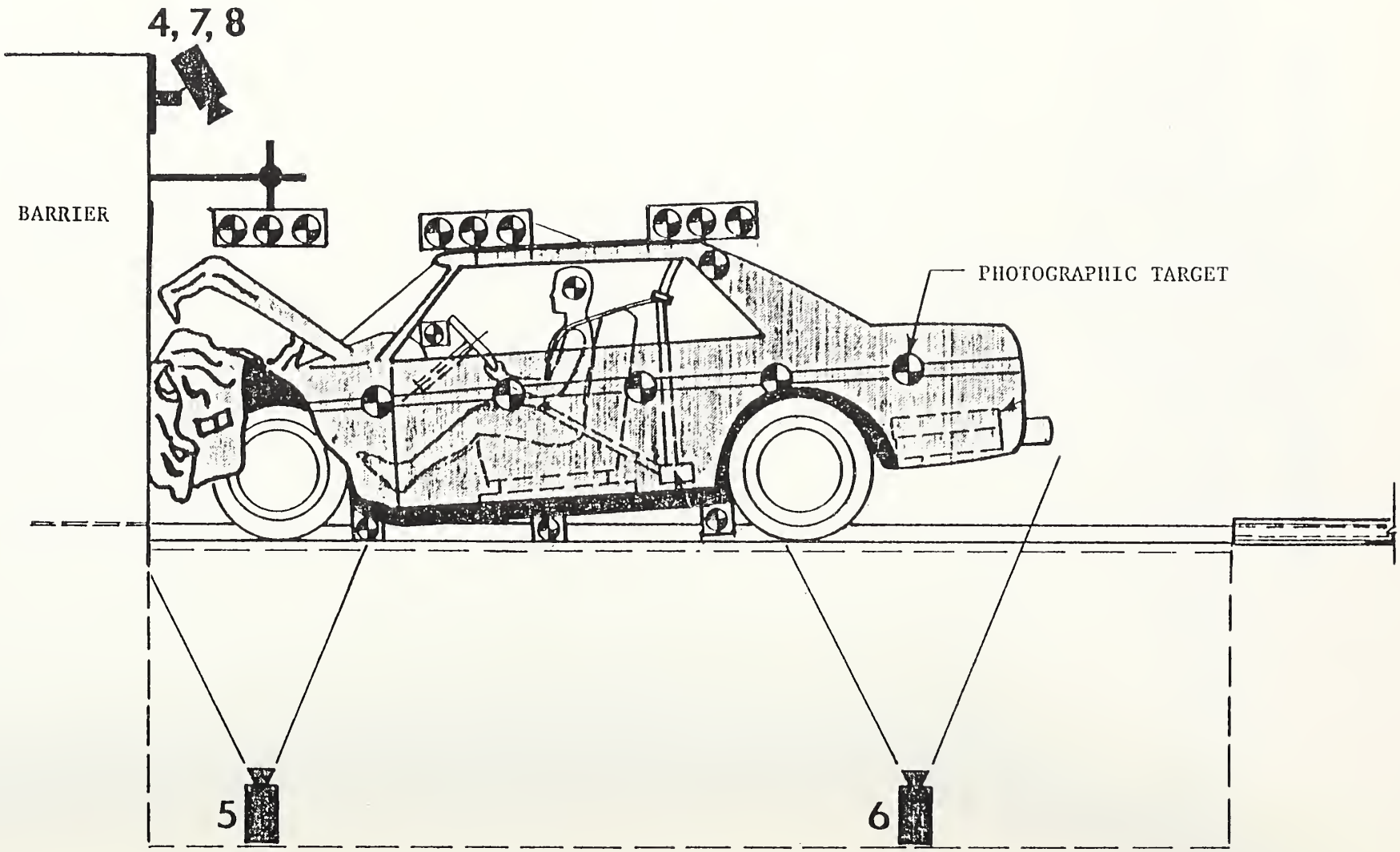
FMVSS NO. 208 - READINESS INDICATOR DATA

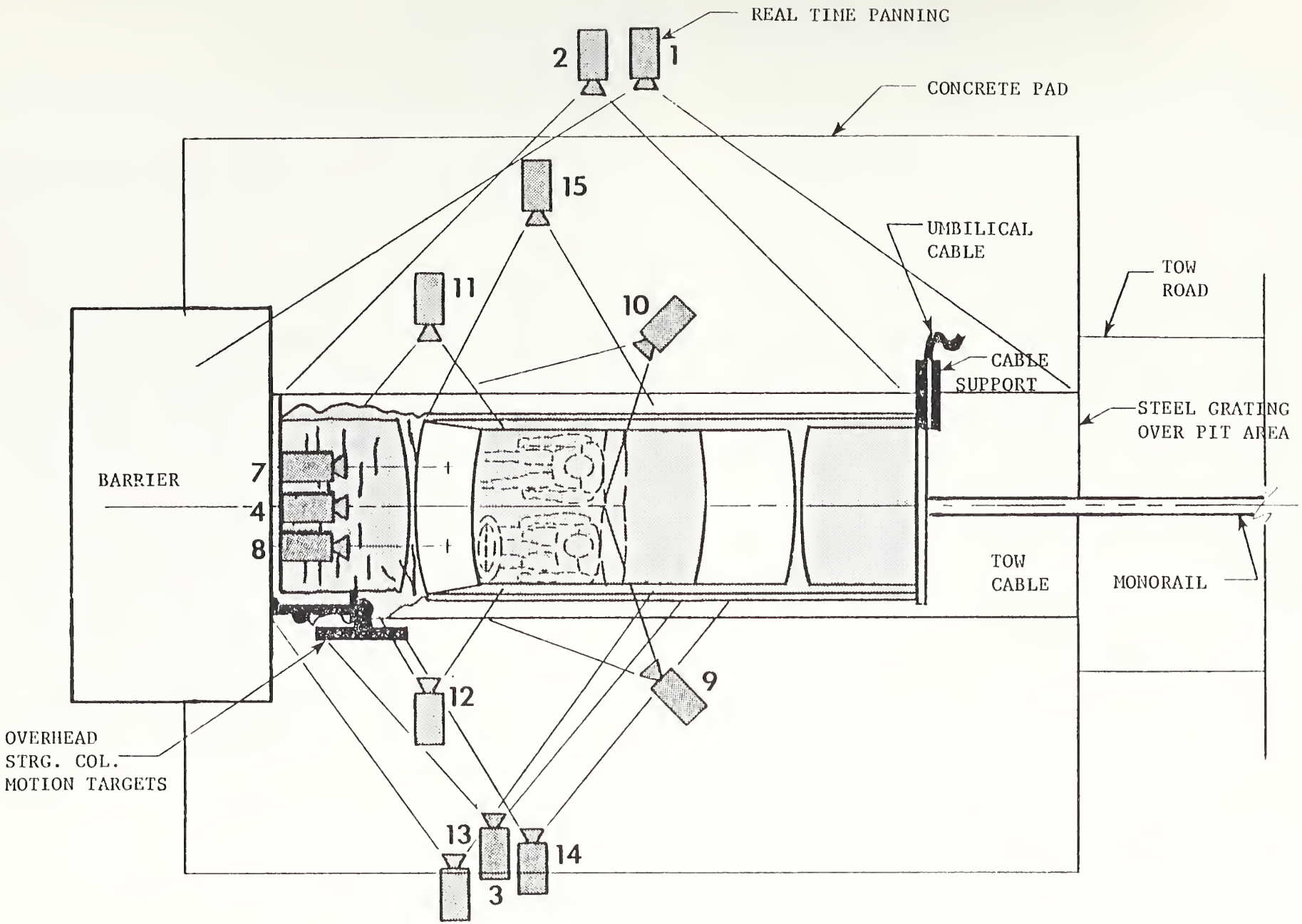
AN OCCUPANT RESTRAINT SYSTEM THAT DEPLOYS IN THE EVENT OF A CRASH SHALL HAVE A MONITORING SYSTEM WITH A READINESS INDICATOR. A TOTALLY MECHANICAL SYSTEM IS EXEMPT FROM THIS REQUIREMENT. NA, vehicle did not contain a crash-deployed occupant protection system.

SECTION 3.0

CAMERA INFORMATION

CAMERA POSITIONS





CAMERA POSITIONS

HIGH SPEED CAMERA LOCATIONS

TEST NO.: 871103 VEHICLE: Toyota Camry

CAMERA NO.	VIEW	CAMERA POSITIONS (IN)* X	Y	Z	ANGLE** (DEG)	FILM PLANE TO HEAD TARGET	LENS (MM)	SPEED (FPS)
1	Real time panning	-142.0	504.0	61.0	NA	NA	16	24
2	Vehicle crush	-81.3	266.4	37.1	-2	NA	13	500
3	Dummy kinematics	-41.5	-295.0	44.0	-4	251.5	25	500
4	Windshield damage	-6.0	0.0	89.0	40	NA	8.5	502
5	Crush & fluid spillage	-50.5	0.0	-92.4	90	NA	13	998
6	Fluid spillage	-99.3	0.0	-99.0	90	NA	13	999
7	Passenger kinematics	-4.5	13.8	93.0	-50	NA	17	501
8	Driver kinematics	-6.8	-14.5	93.0	-50	NA	17	501
9	Driver kinematics	-157.3	116.0	87.0	-27	117.5	25	498
10	Passenger kinematics	-152.1	-116.0	87.0	-26	112.2	25	500
11	Windshield intrusion	-38.1	306.1	44.0	0	NA	50	498
12	Windshield intrusion	-53.0	-309.4	42.3	0	NA	50	500
13	Column movement	-112.0	-286.0	103.0	-14	NA	25	502
14	Column movement	-112.0	-286.0	75.1	-9	NA	25	500
15	Passenger kinematics	-38.8	293.0	45.3	-4	261.5	25	495

*X = Film plane to plane of barrier face

Y = Film plane to monorail centerline

Z = Film plane to ground

**Referenced to horizontal plane

APPENDIX A

PHOTOGRAPHS

1. PRE-TEST FRONT VIEW
2. POST-TEST FRONT VIEW
3. PRE-TEST LEFT SIDE VIEW
4. POST-TEST LEFT SIDE VIEW
5. PRE-TEST RIGHT SIDE VIEW
6. POST-TEST RIGHT SIDE VIEW
7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
9. PRE-TEST LEFT REAR THREE-QUARTER VIEW
10. POST-TEST LEFT REAR THREE-QUARTER VIEW
11. PRE-TEST REAR VIEW
12. POST-TEST REAR VIEW
13. PRE-TEST WINDSHIELD VIEW
14. POST-TEST WINDSHIELD VIEW
15. PRE-TEST ENGINE COMPARTMENT VIEW
16. POST-TEST ENGINE COMPARTMENT VIEW
17. PRE-TEST FRONT UNDERBODY VIEW
18. POST-TEST FRONT UNDERBODY VIEW
19. PRE-TEST DRIVER DUMMY POSITION VIEW
20. POST-TEST DRIVER DUMMY POSITION VIEW
21. PRE-TEST PASSENGER DUMMY POSITION VIEW
22. POST-TEST PASSENGER DUMMY POSITION VIEW
23. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW
24. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1
25. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2
26. PRE-TEST DUMMY & VEHICLE INTERIOR VIEW
27. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1
28. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2
29. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1
30. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2
31. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 1
32. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 2
33. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW
34. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW

Figure 1. PRE-TEST FRONT VIEW

Figure 2. POST-TEST FRONT VIEW

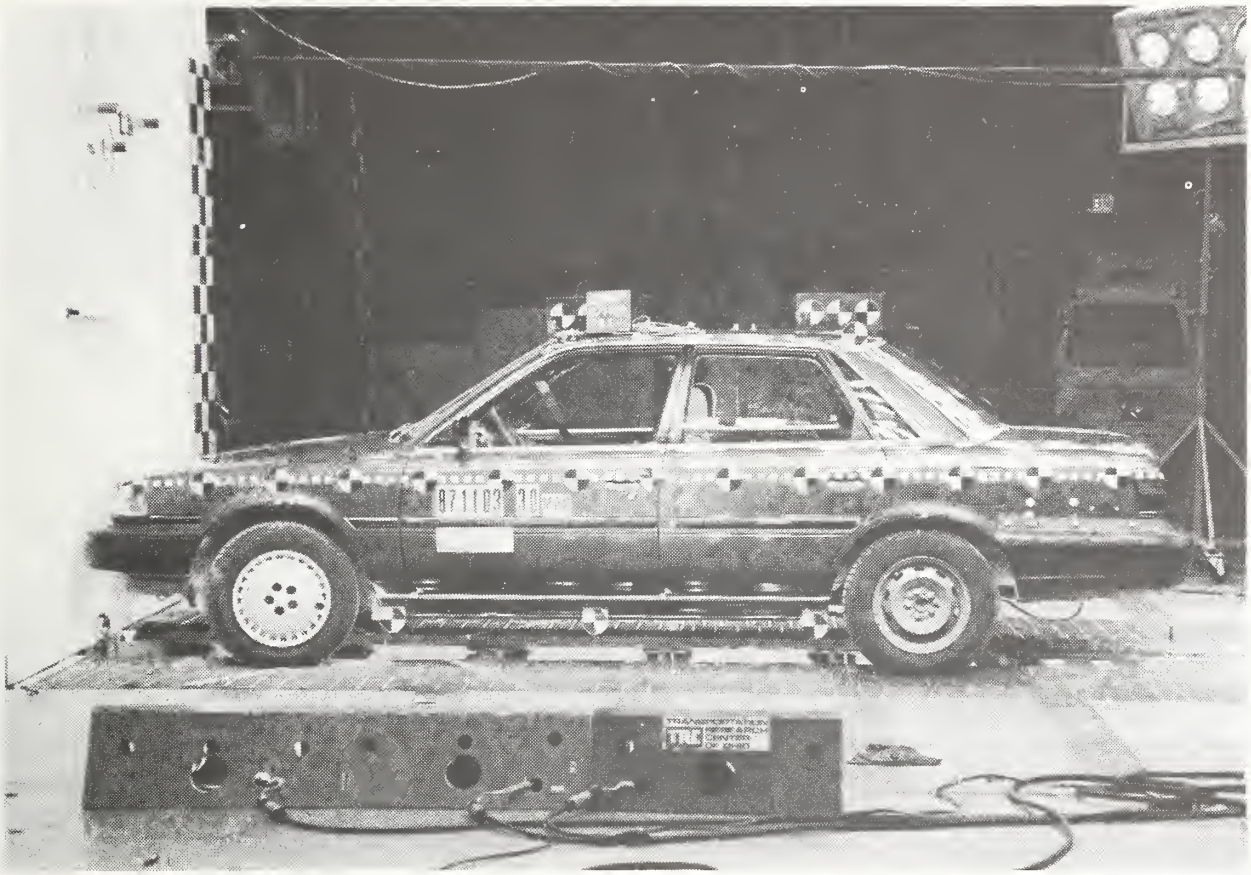


Figure 3. PRE-TEST LEFT SIDE VIEW

Figure 4. POST-TEST LEFT SIDE VIEW

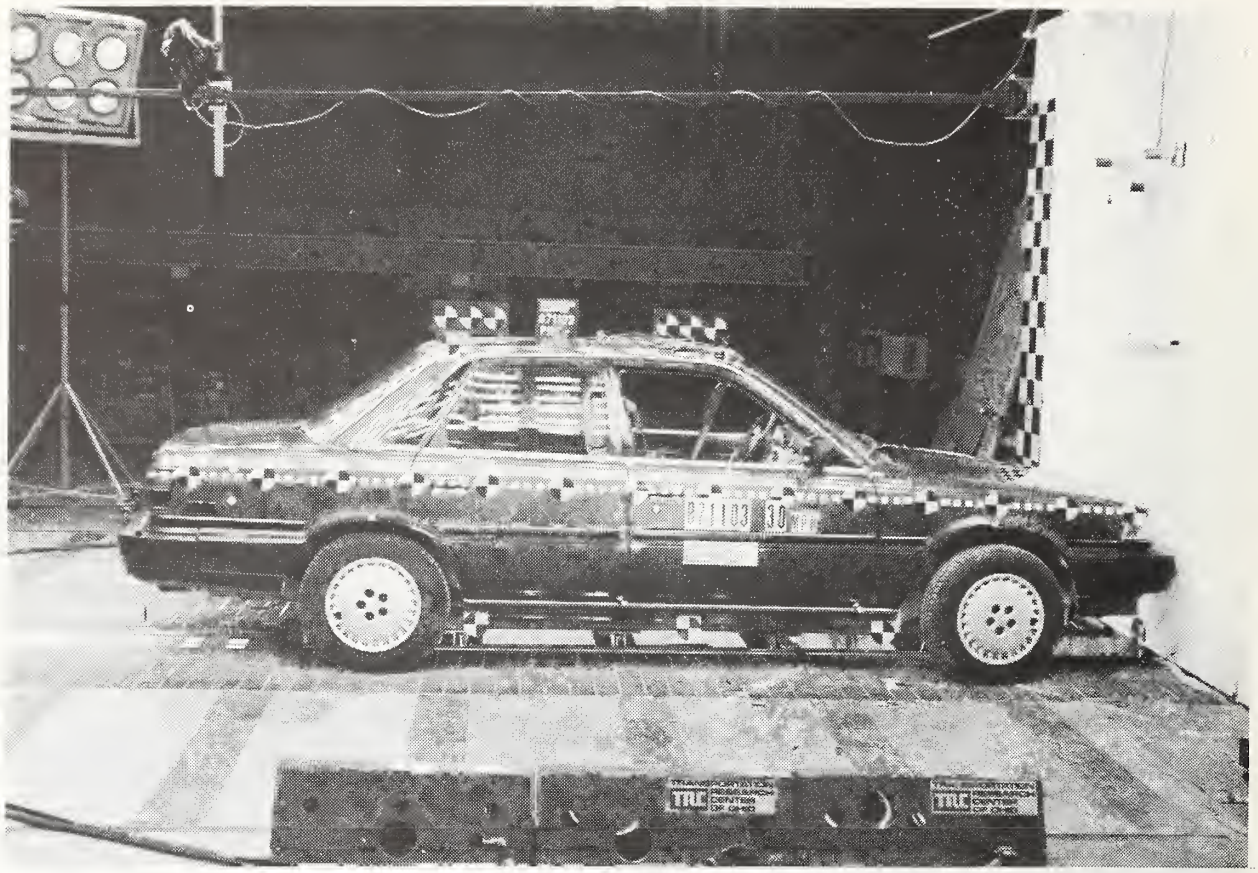


Figure 5. PRE-TEST RIGHT SIDE VIEW

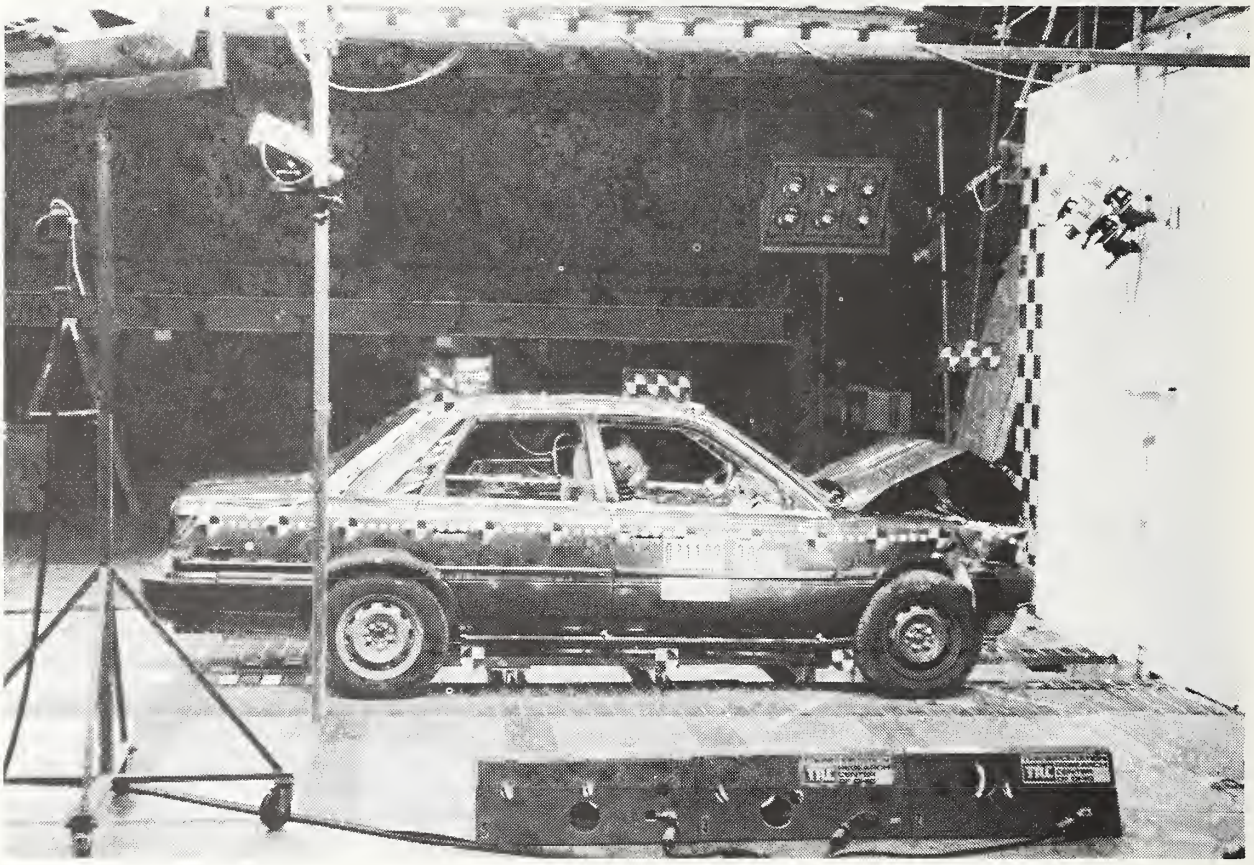


Figure 6. POST-TEST RIGHT SIDE VIEW

Figure 7. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

Figure 8. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

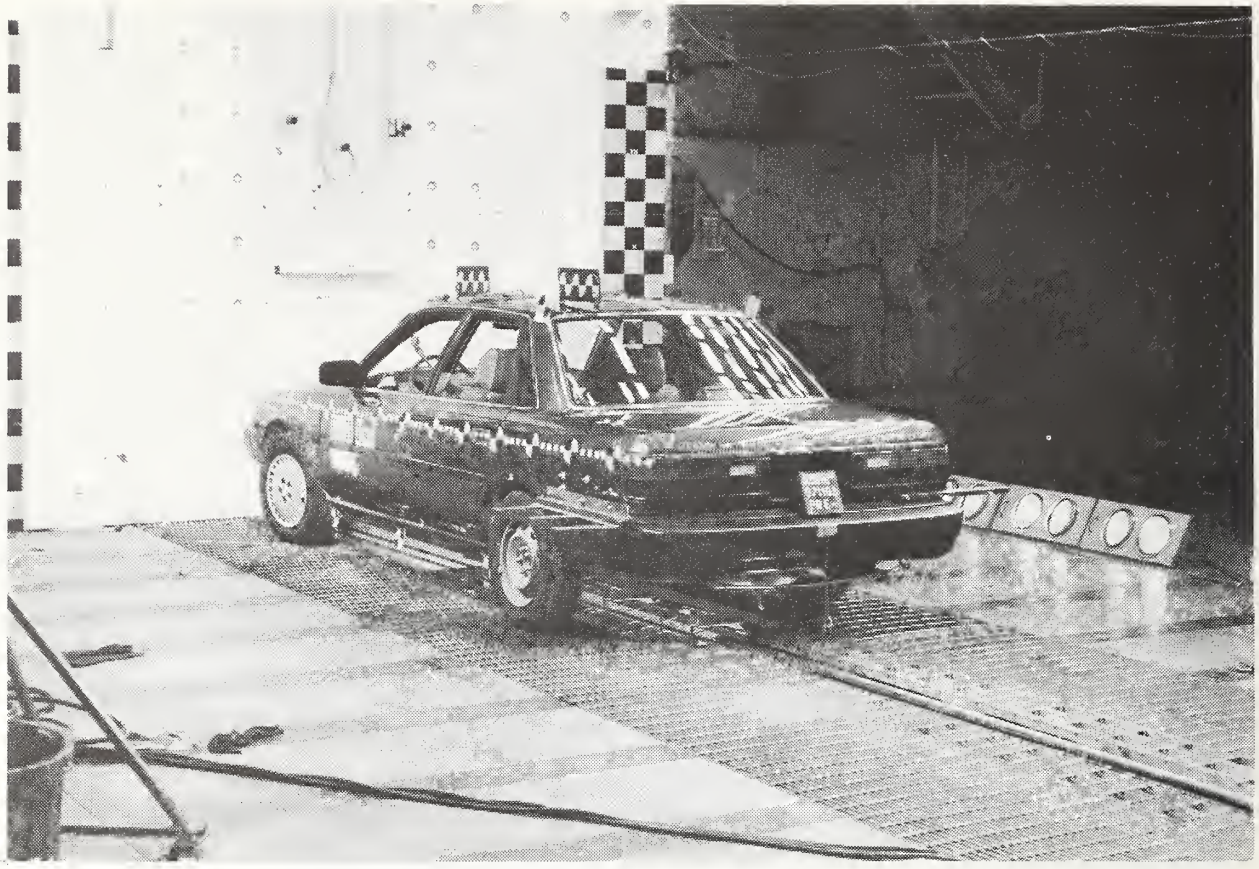


Figure 9. PRE-TEST LEFT REAR THREE-QUARTER VIEW

Figure 10. POST-TEST LEFT REAR THREE-QUARTER VIEW

Figure 11. PRE-TEST REAR VIEW

Figure 12. POST-TEST REAR VIEW

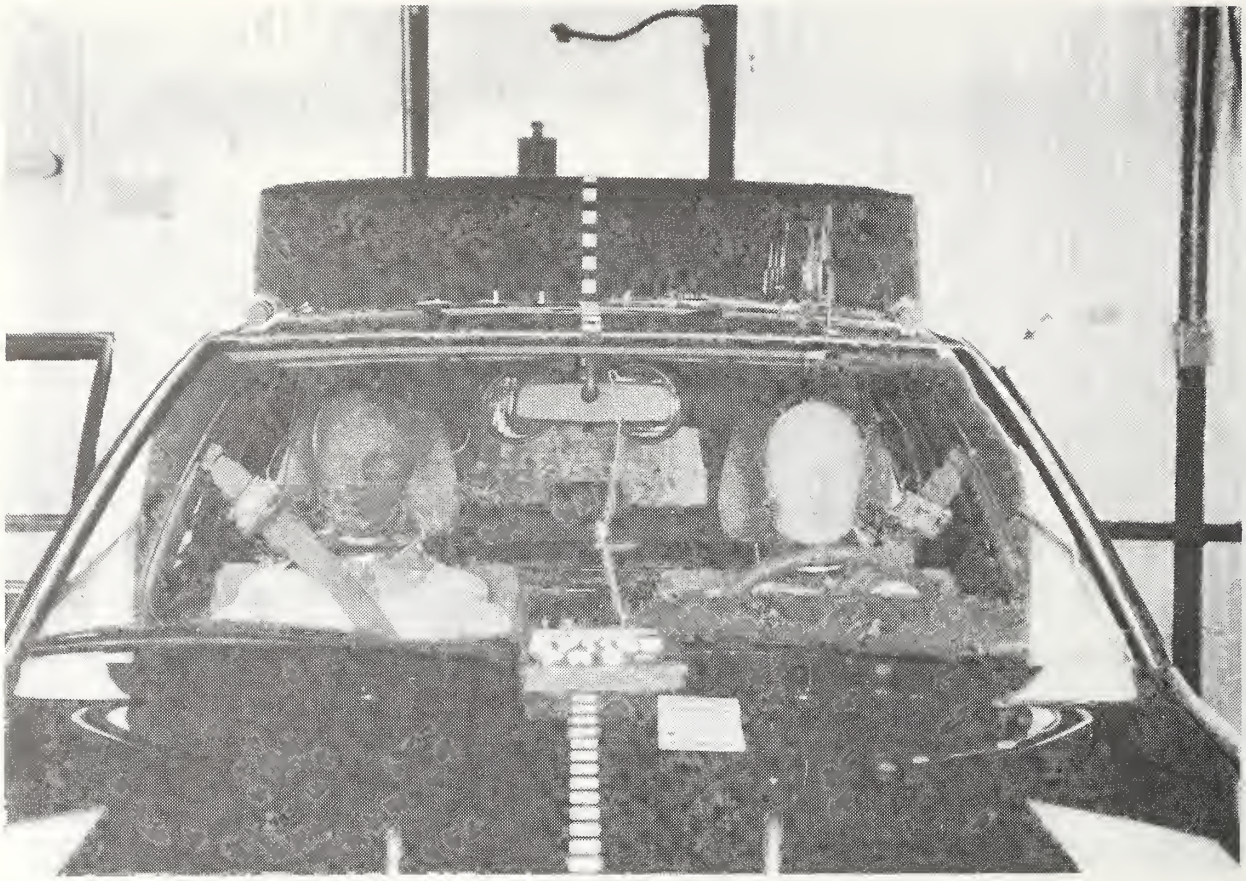


Figure 13. PRE-TEST WINDSHIELD VIEW

Figure 14. POST-TEST WINDSHIELD VIEW

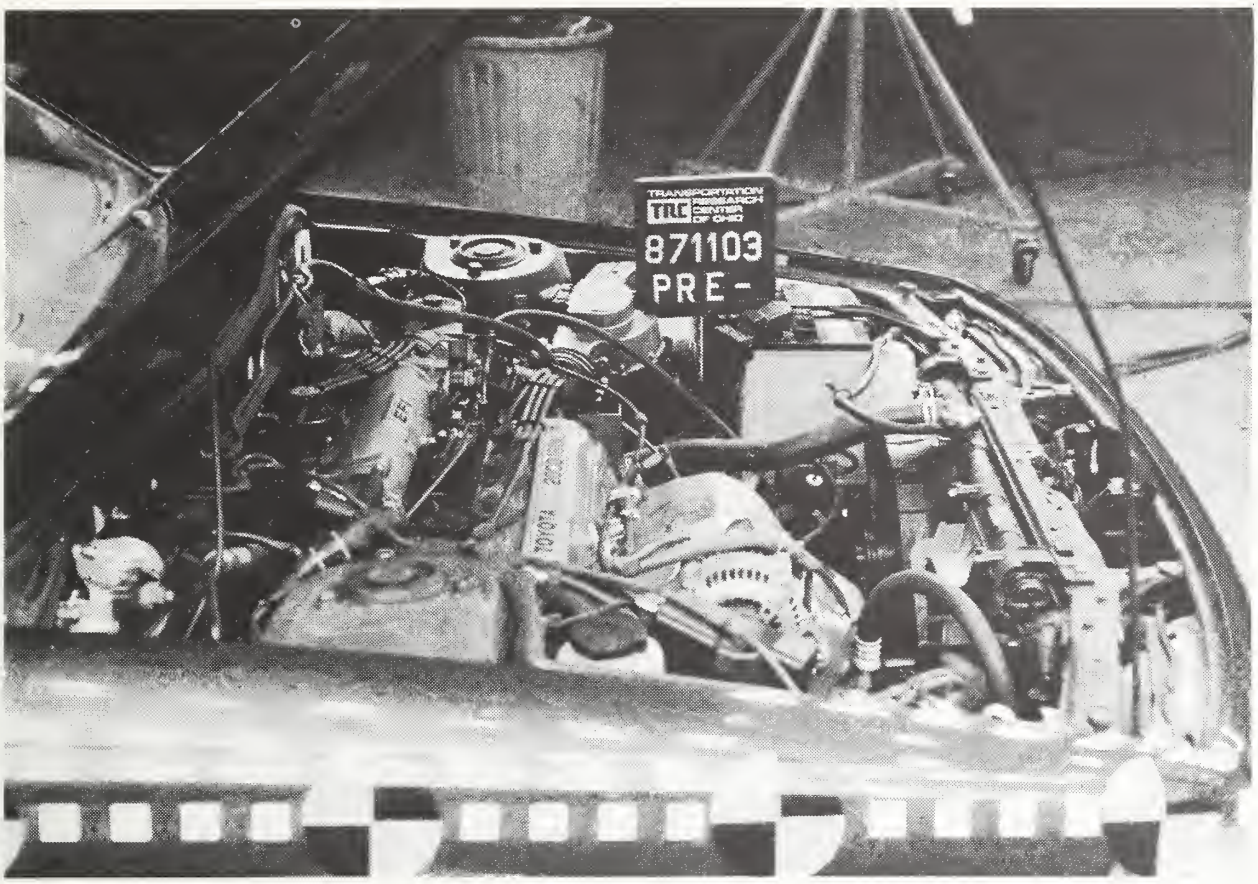


Figure 15. PRE-TEST ENGINE COMPARTMENT VIEW

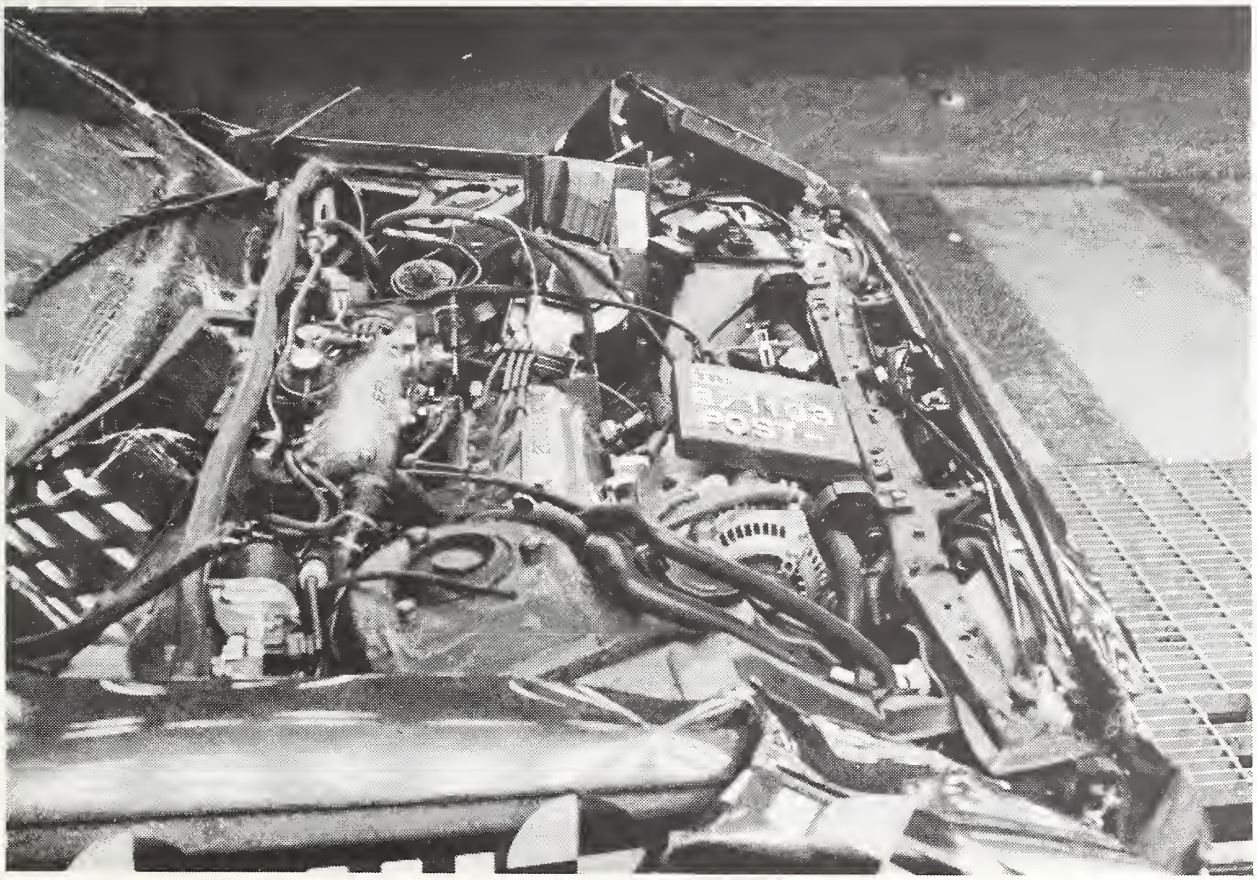


Figure 16. POST-TEST ENGINE COMPARTMENT VIEW

Figure 17. PRE-TEST FRONT UNDERBODY VIEW

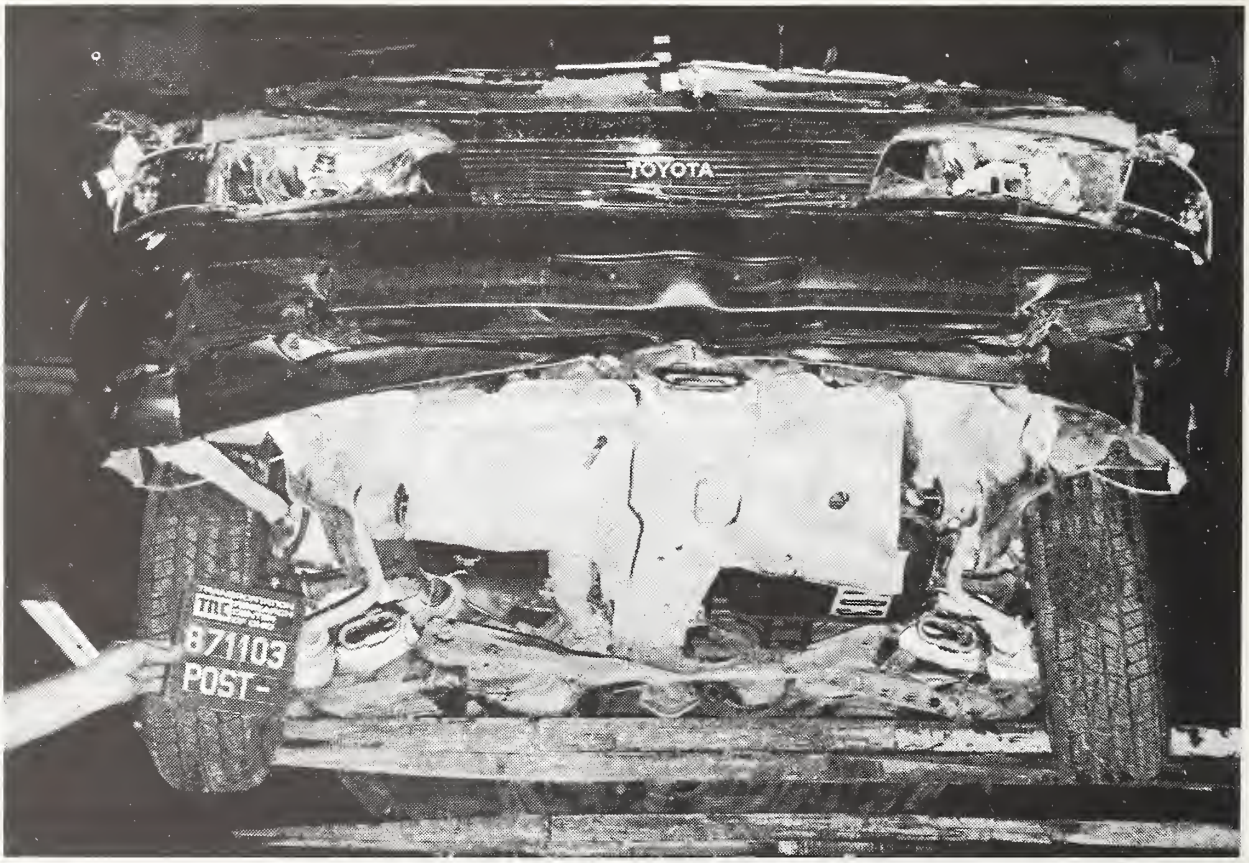


Figure 18. POST-TEST FRONT UNDERBODY VIEW

Figure 19. PRE-TEST DRIVER DUMMY POSITION VIEW

Figure 20. POST-TEST DRIVER DUMMY POSITION VIEW

Figure 21. PRE-TEST PASSENGER DUMMY POSITION VIEW

Figure 22. POST-TEST PASSENGER DUMMY POSITION VIEW

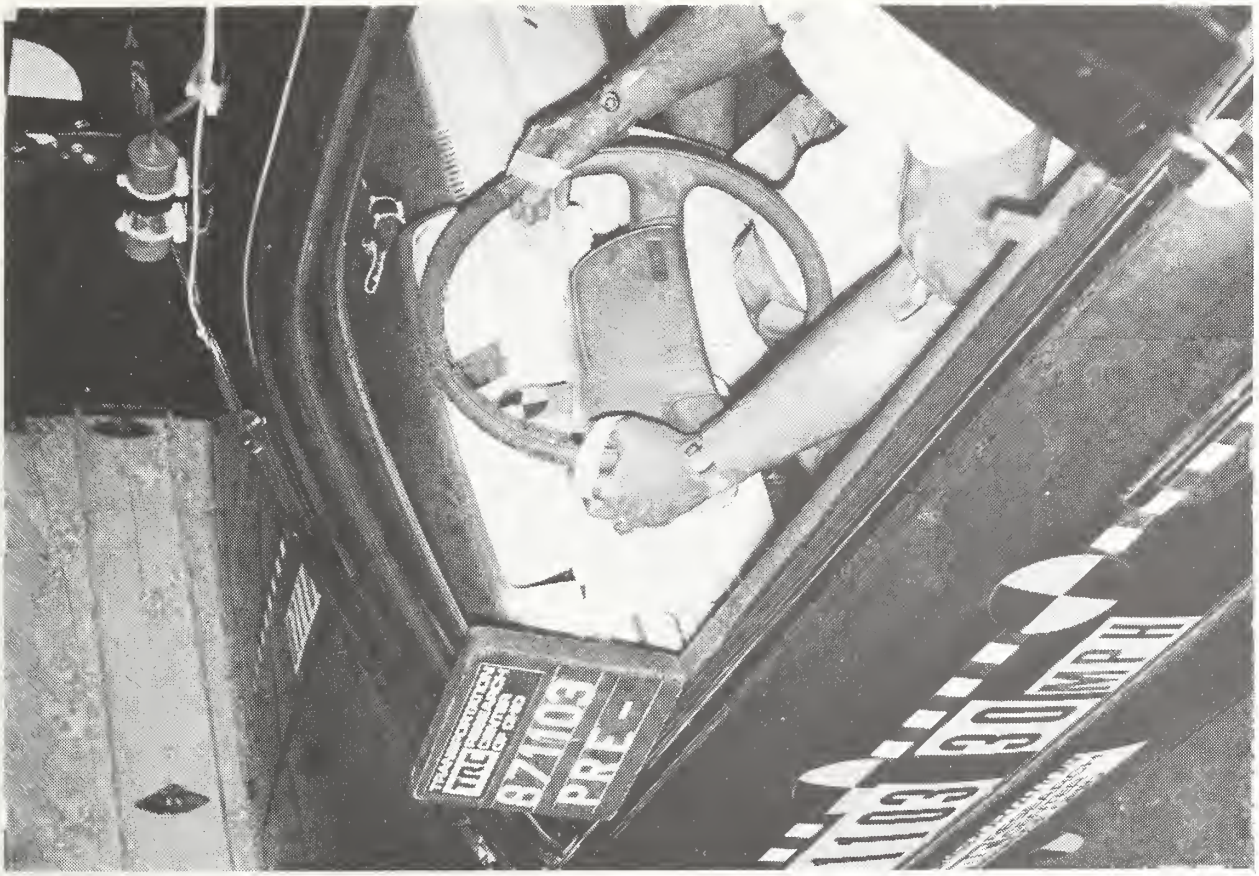


Figure 23. PRE-TEST DRIVER DUMMY & VEHICLE INTERIOR VIEW

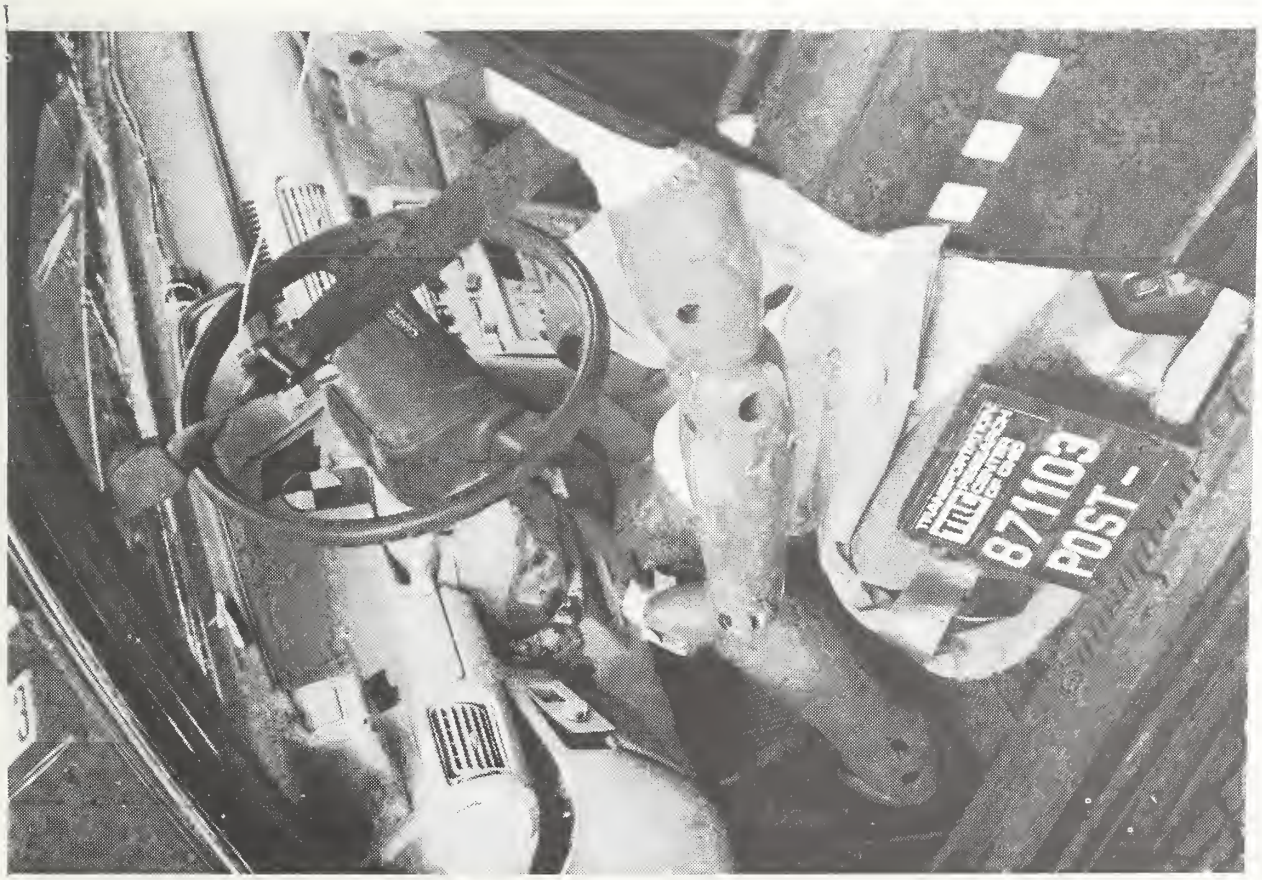


Figure 24. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 1

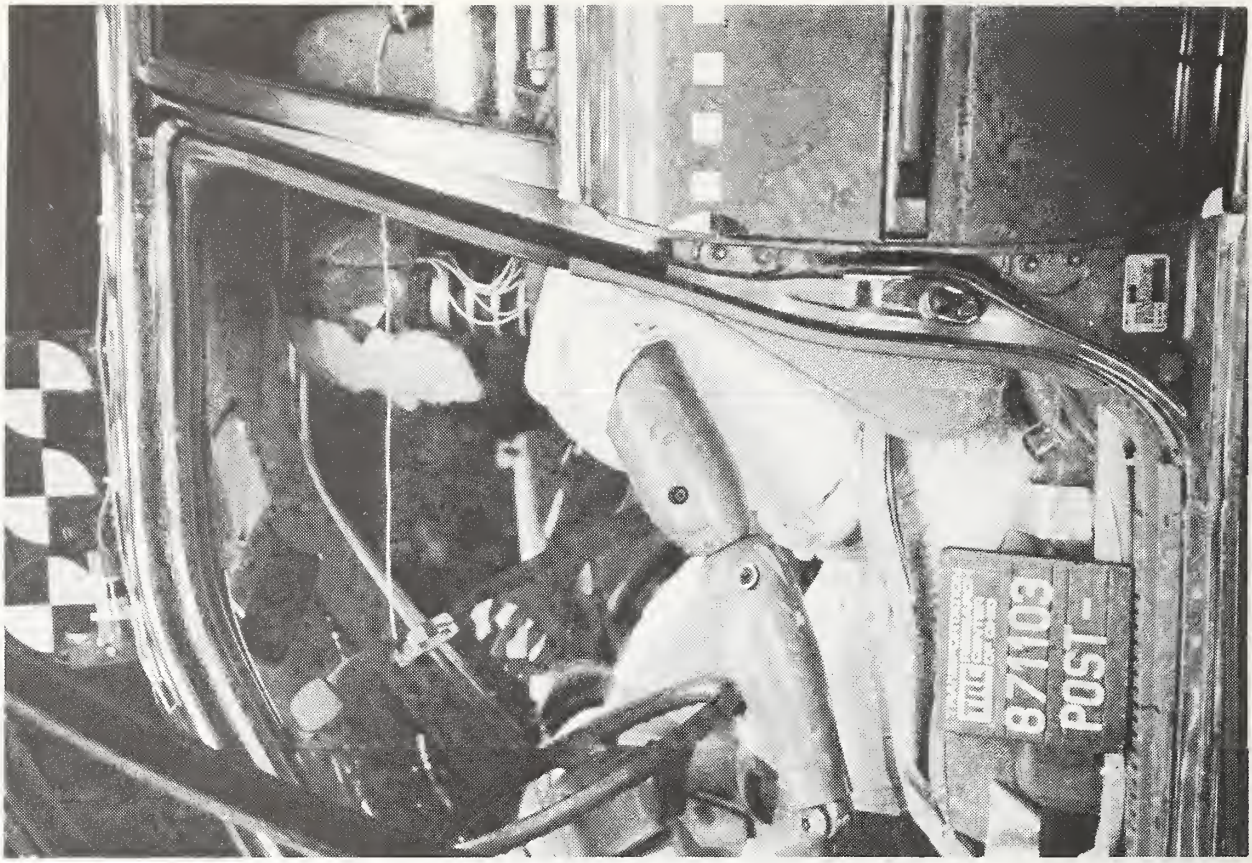


Figure 25. POST-TEST DRIVER DUMMY & VEHICLE INTERIOR - VIEW 2

Figure 26. PRE-TEST DUMMY & VEHICLE INTERIOR VIEW

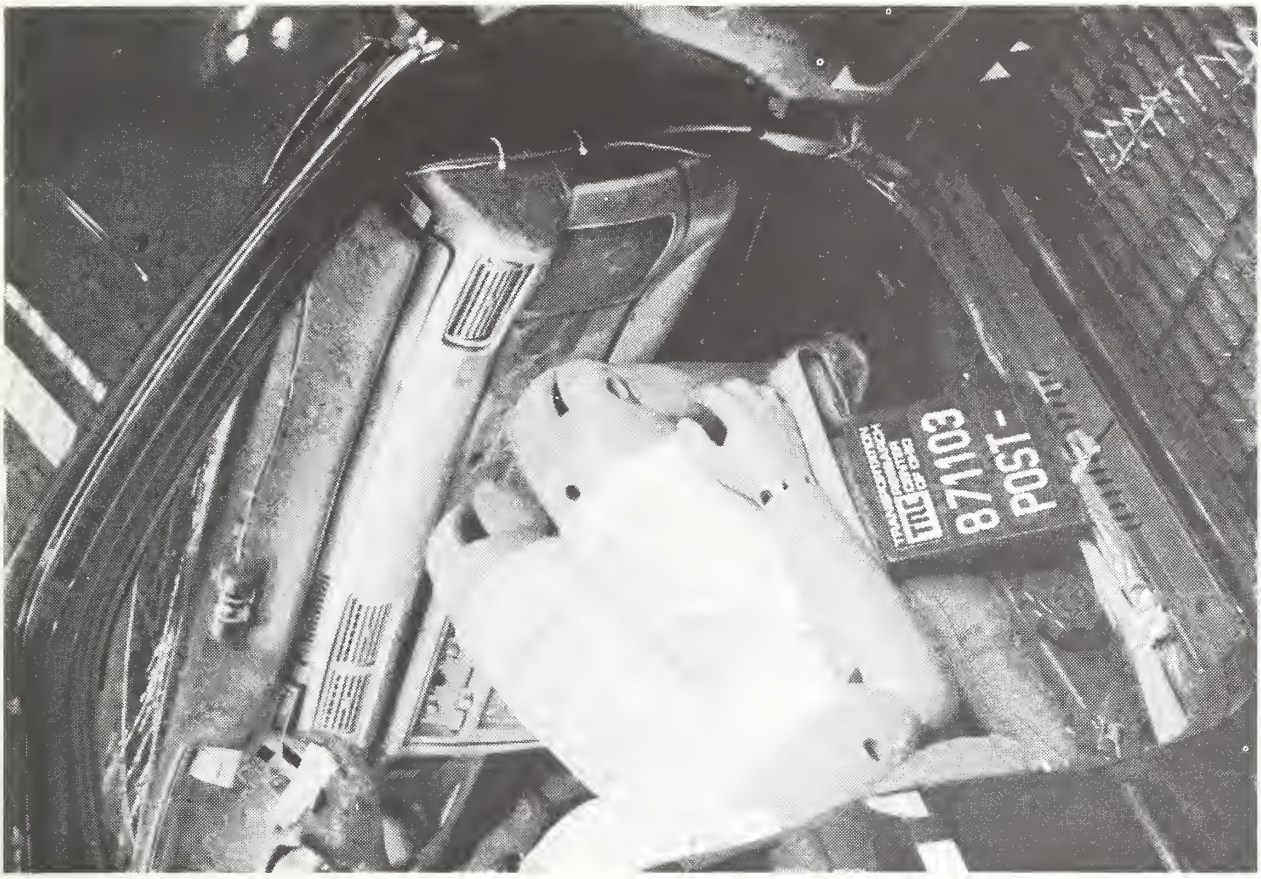


Figure 27. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 1

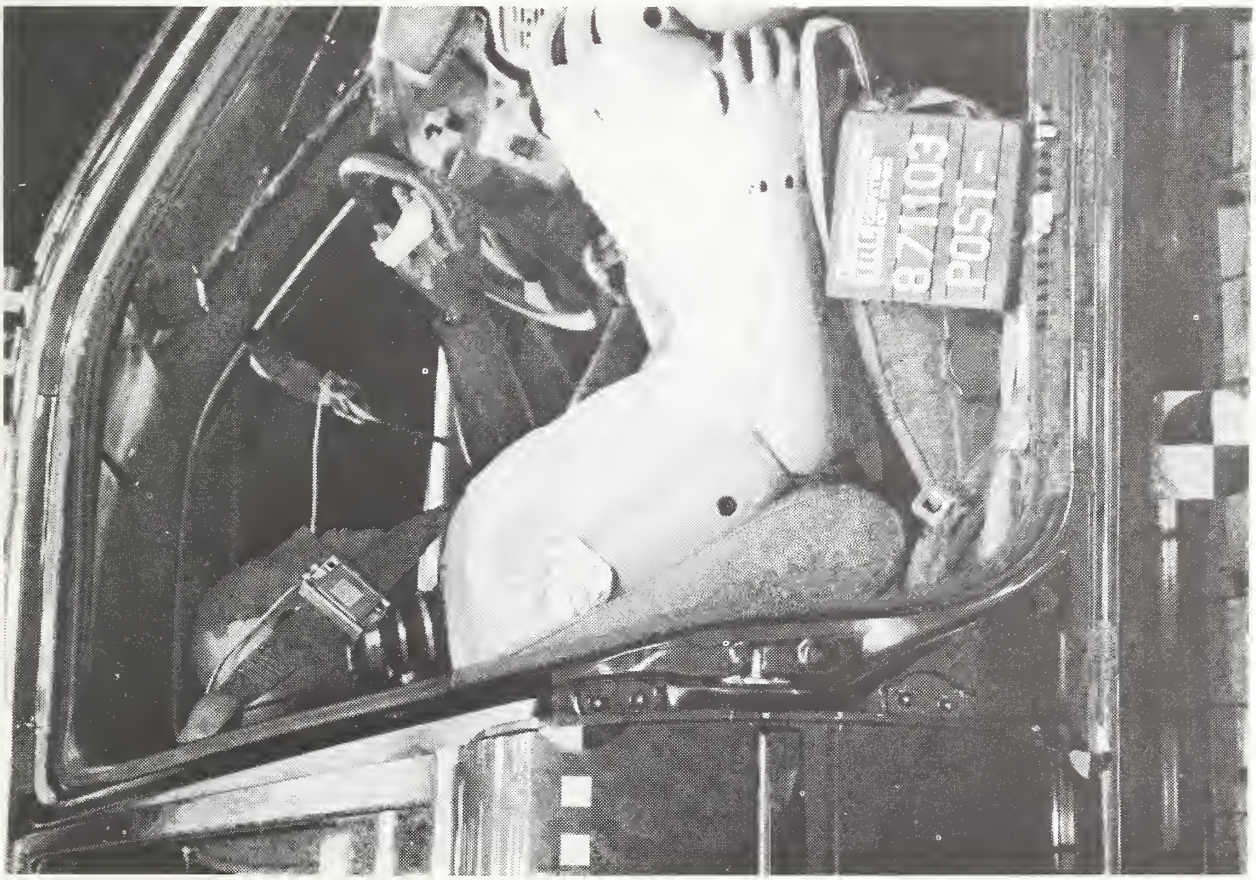


Figure 28. POST-TEST PASSENGER DUMMY & VEHICLE INTERIOR - VIEW 2

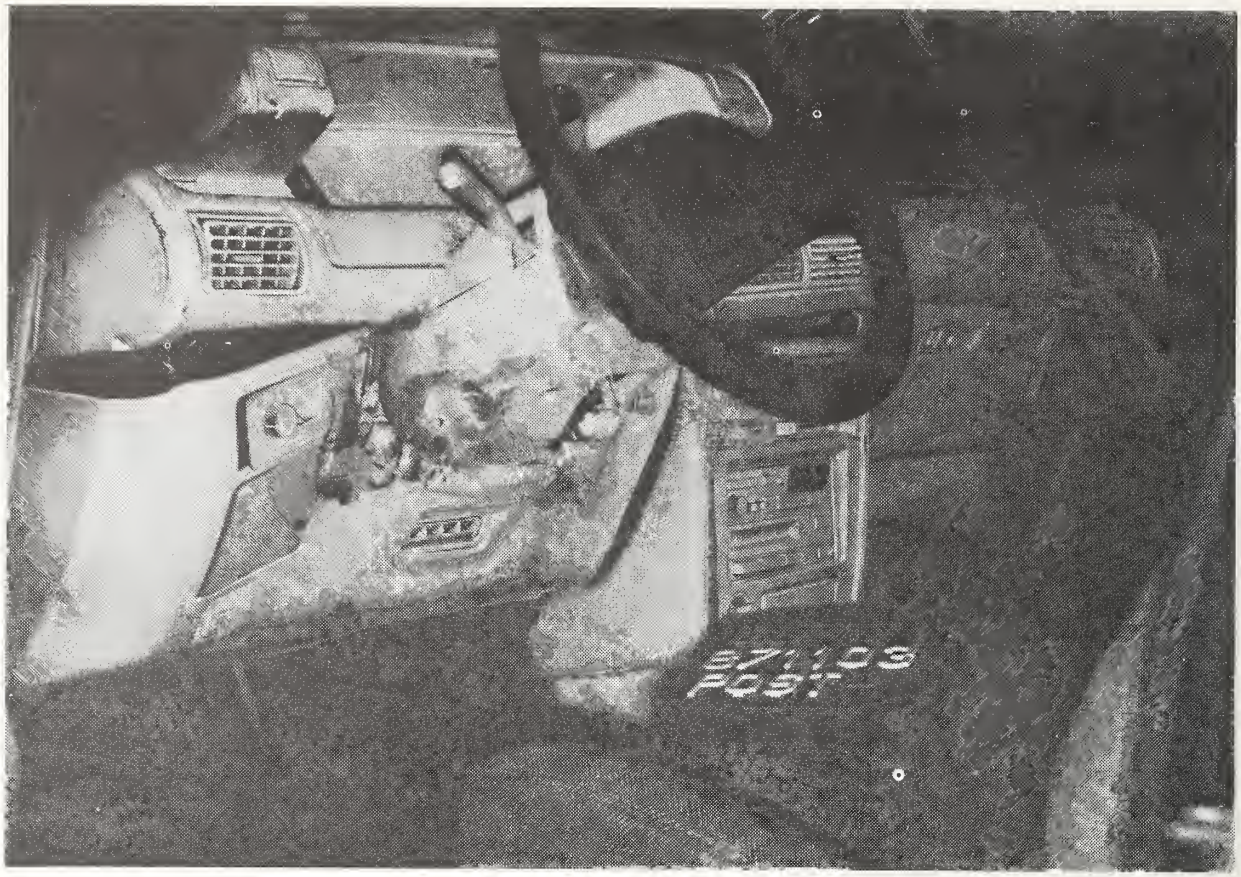


Figure 29. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 1

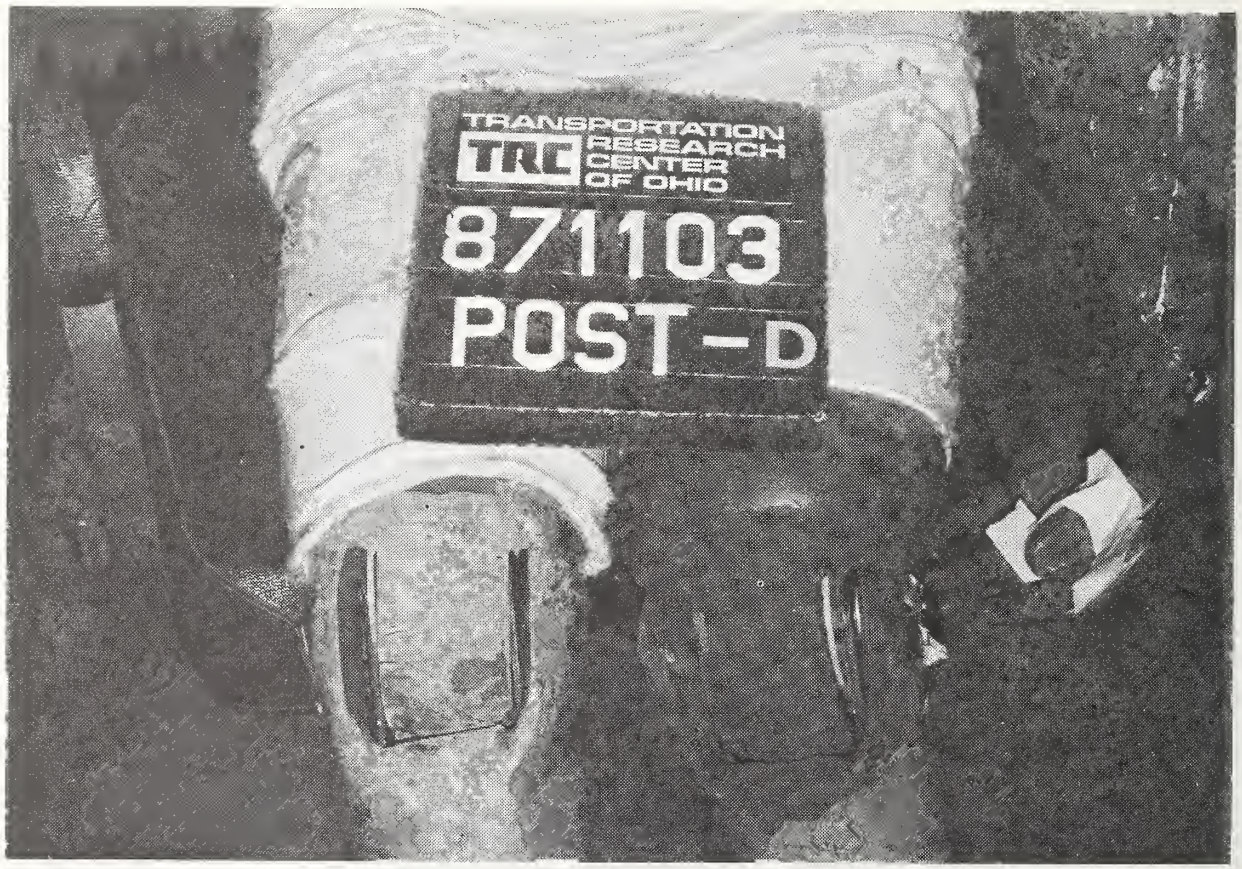


Figure 30. POST-TEST DRIVER DUMMY HEAD/KNEE CONTACT - VIEW 2

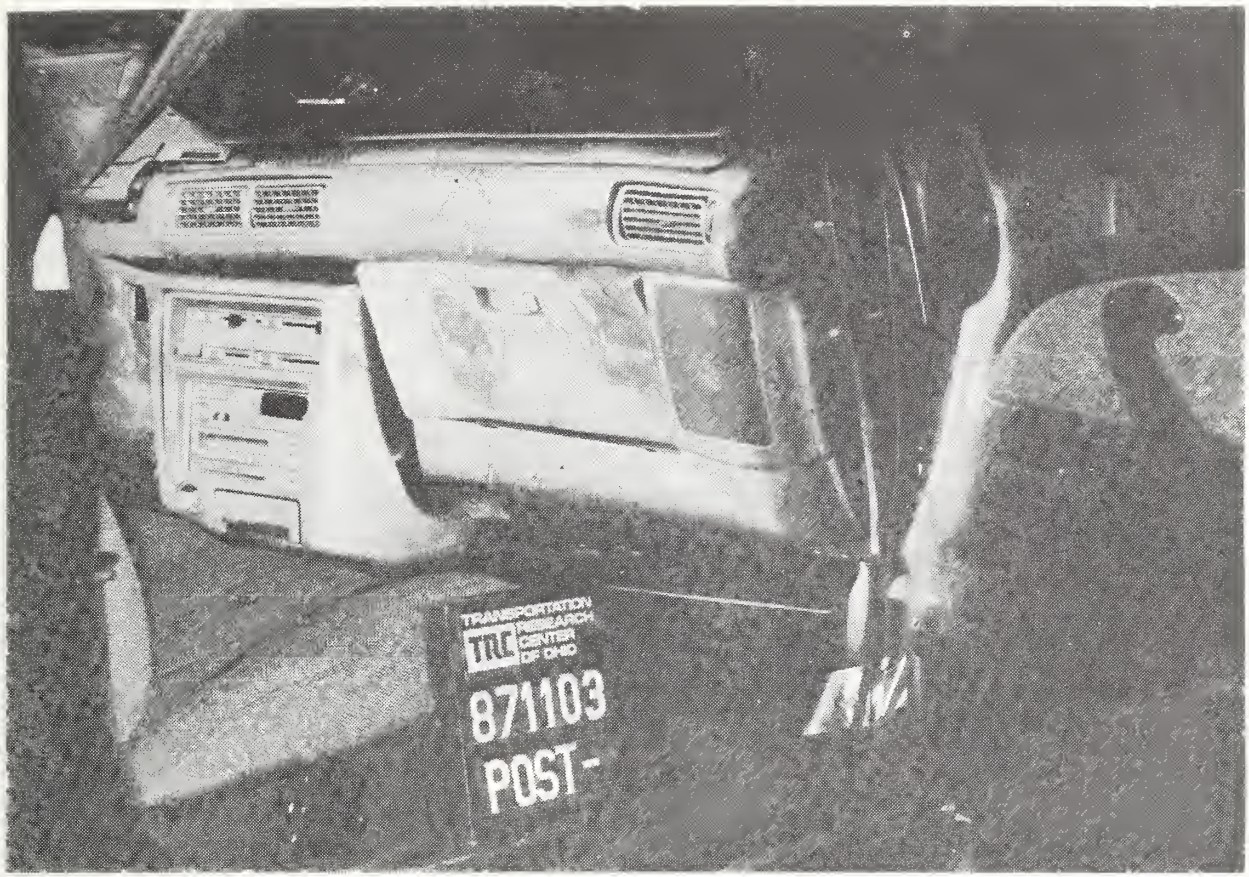


Figure 31. POST-TEST PASSENGER DUMMY HEAD KNEE CONTACT - VIEW 1

Figuer 32. POST-TEST PASSENGER DUMMY HEAD/KNEE CONTACT - VIEW 2

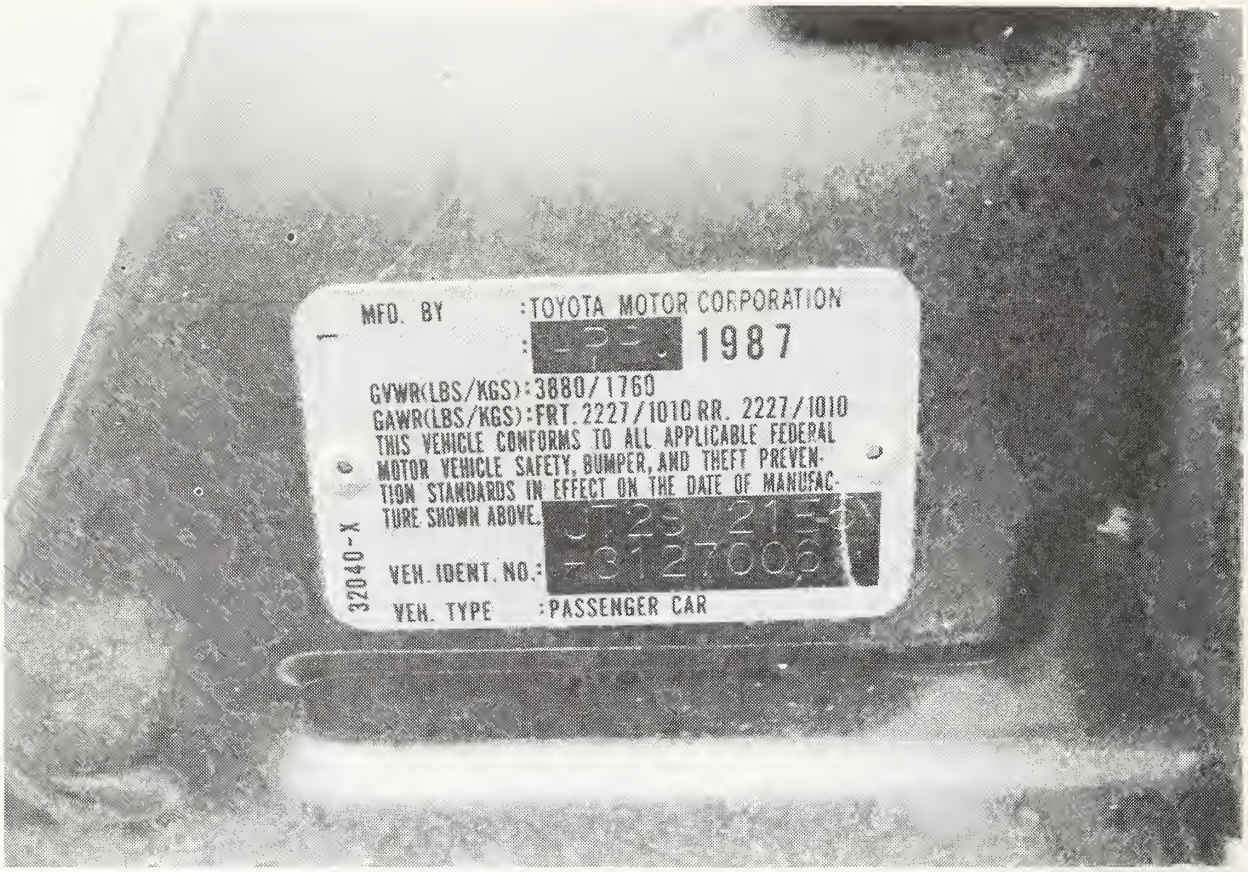


Figure 33. PRE-TEST VEHICLE CERTIFICATION LABEL VIEW

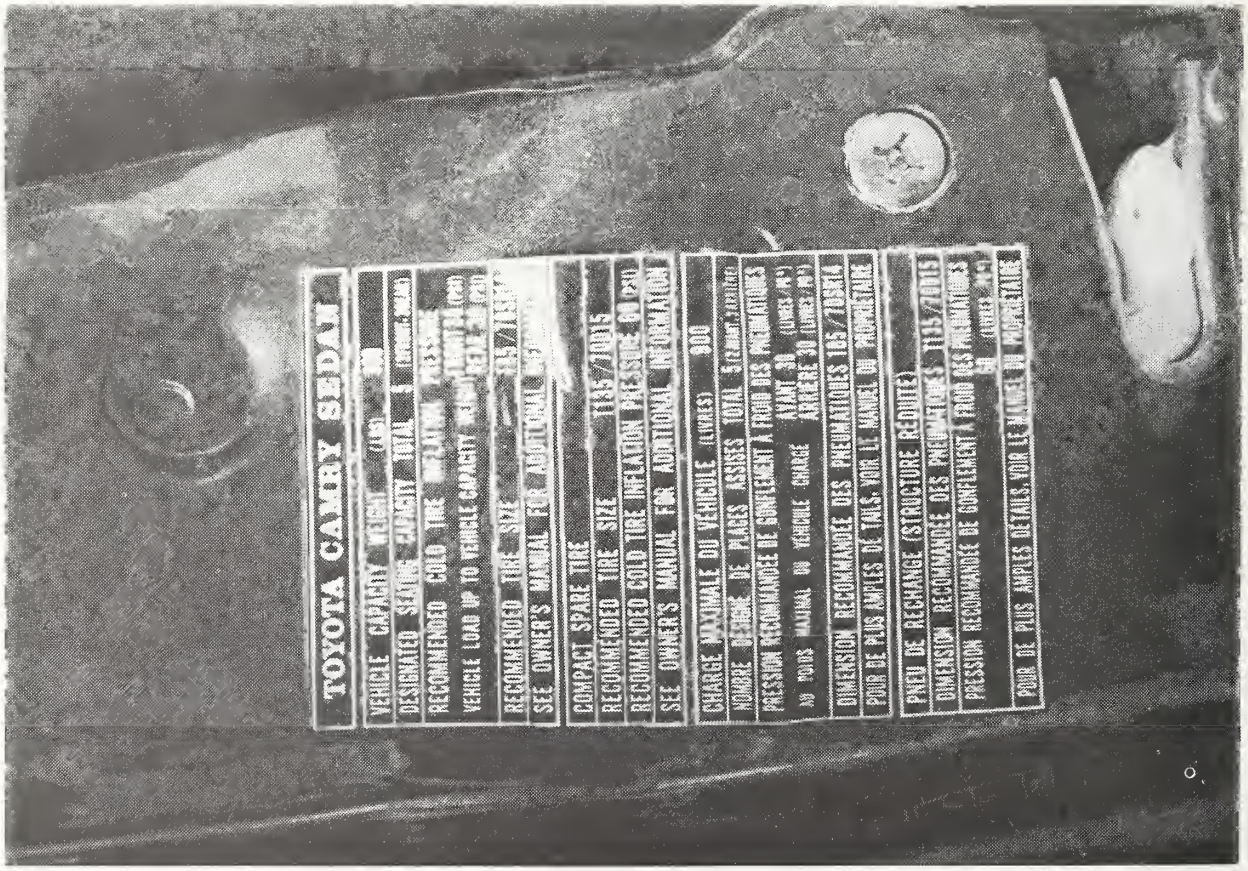


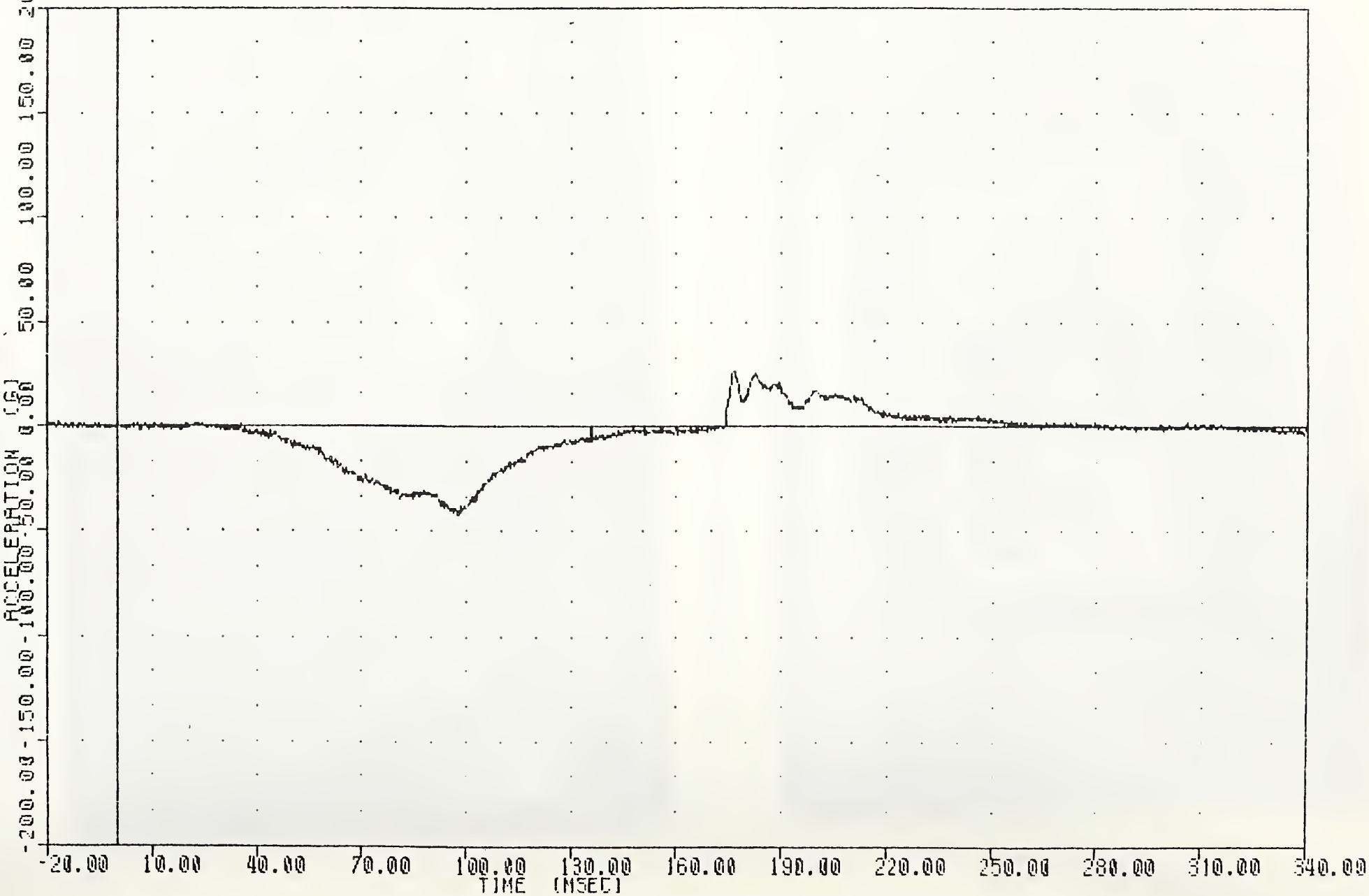
Figure 34. PRE-TEST VEHICLE TIRE LOAD LABEL VIEW

APPENDIX B

DATA PLOTS

TRC , 871013
20B FRONTAL CRASH TEST
87286
HEDXG1

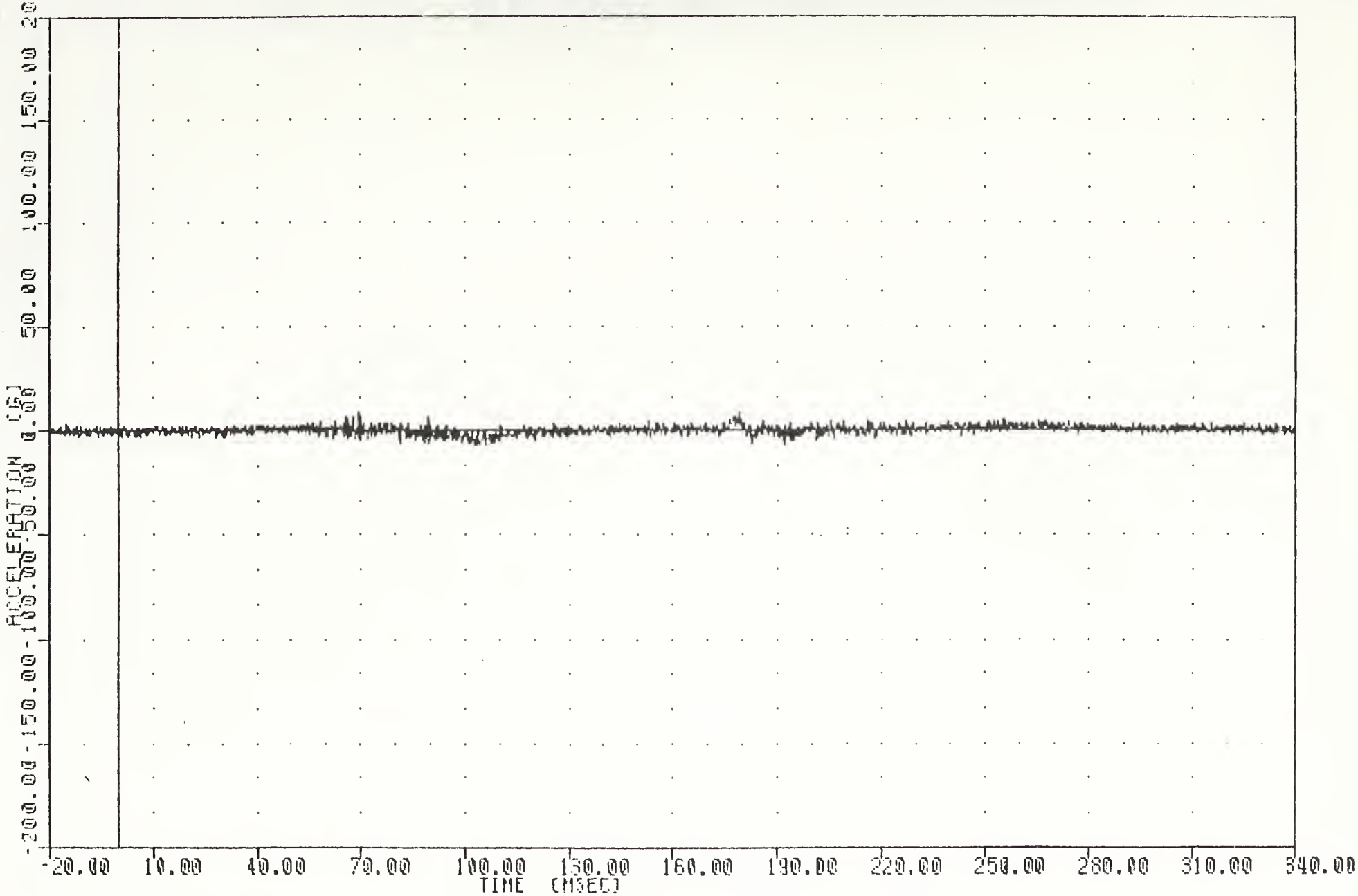
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -42.27 @ 97.38 , 27.08 @ 176.00



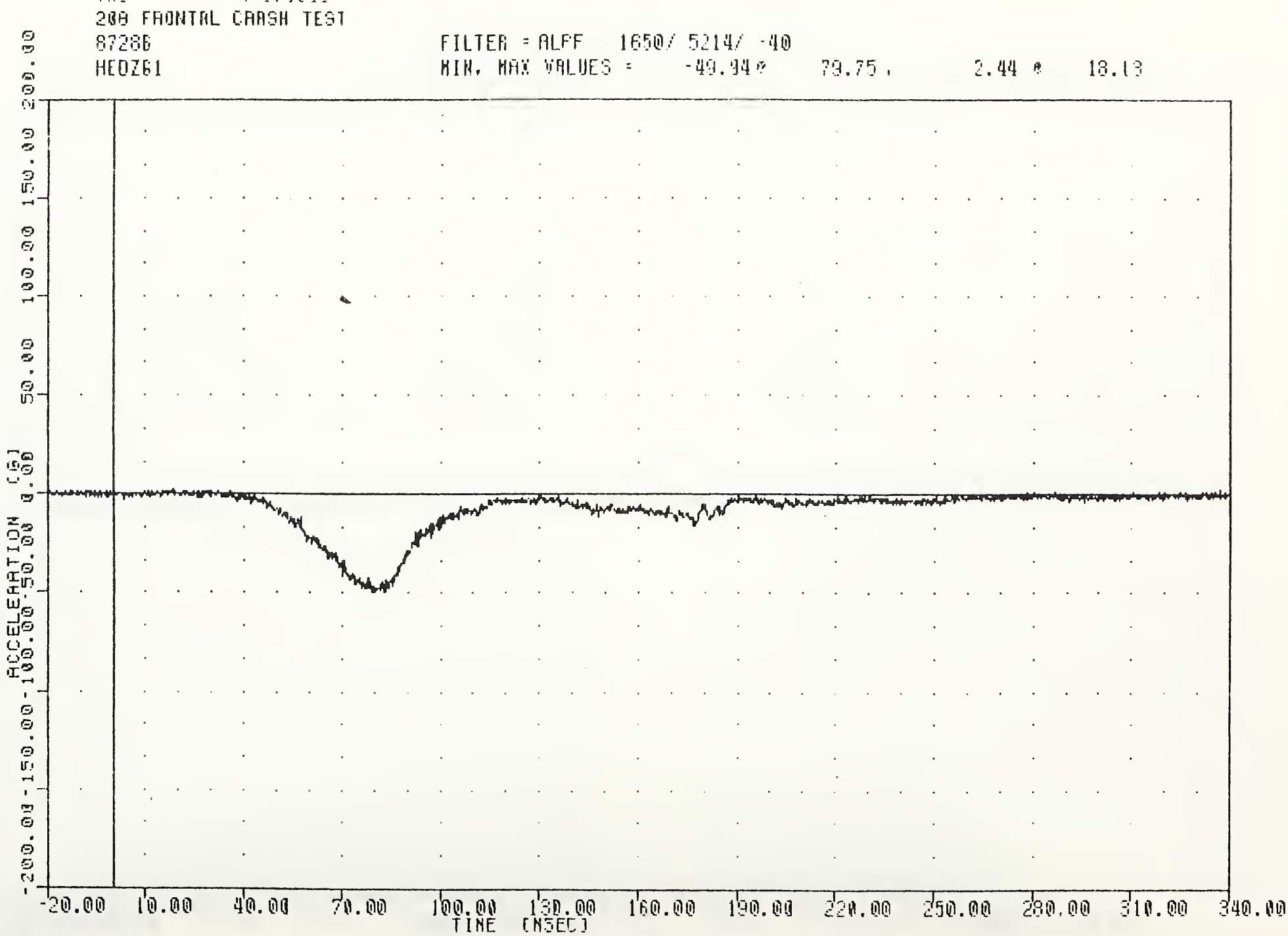
SUBARU XT INTO FRONTAL BARRIER
DRIVER HEAD X AXIS ACCCELERATION

TRC , 871013
20B FRONTAL CRASH TEST
87286
HEDYG1

FILTER = ALFF 1650/ 5214/ -40
MIN, MAX VALUES = -7.10 @ 191.88 , 8.60 @ 179.00



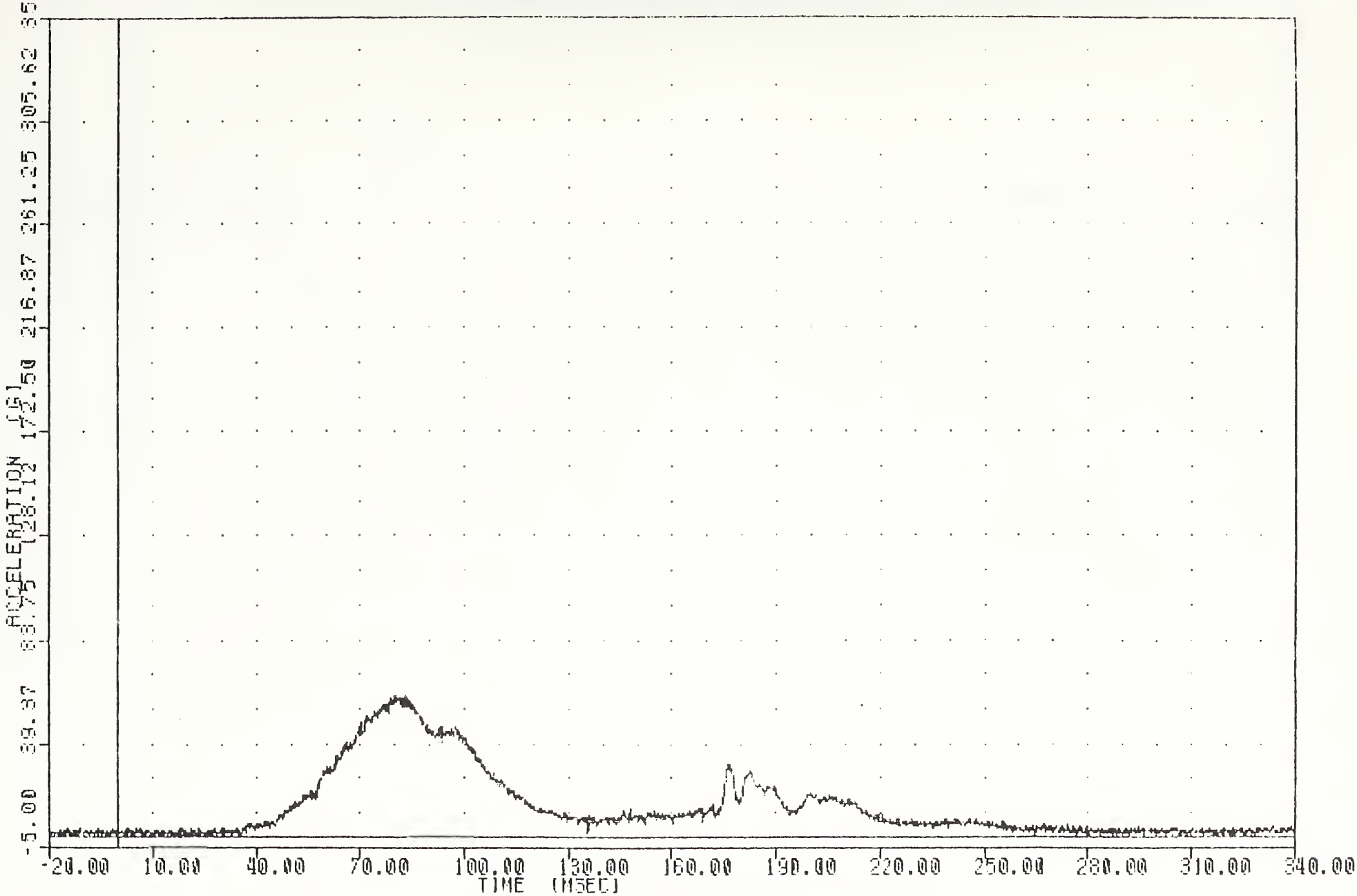
SUBARU XT INTO FRONTAL BARRIER
DRIVER HEAD Y AXIS ACCELERATION



SUBARU XT INTO FRONTAL BARRIER
DRIVER HEAD Z AXIS ACCELERATION

TRC , 871013
208 FRONTAL CRASH TEST
87286
HEDRG1

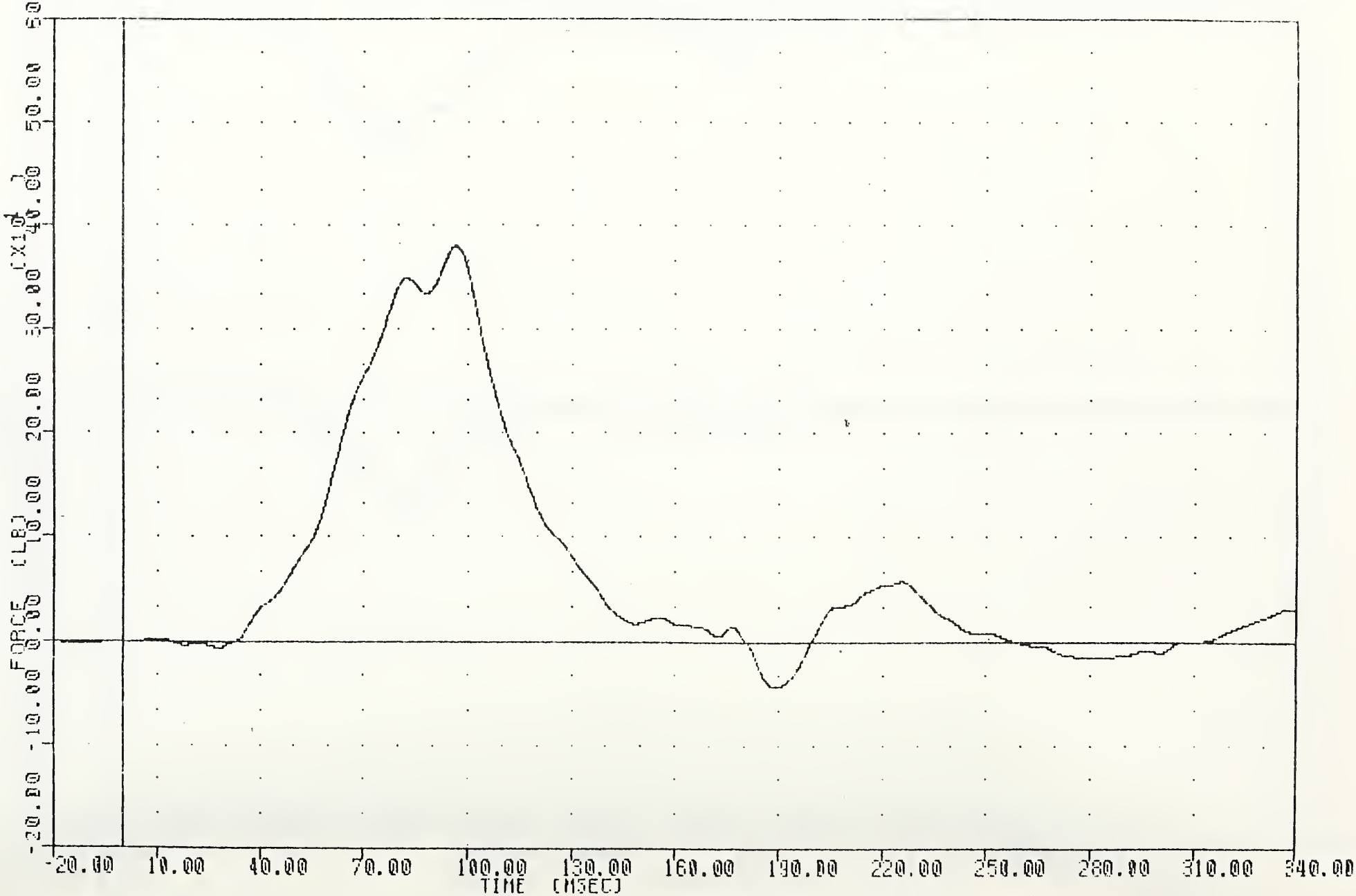
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.06 @ 317.80 , 60.03 @ 93.13



SUBARU XT INTO FRONTAL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TPC , 871013
208 FRONTAL CRASH TEST
87286
NEKXF1

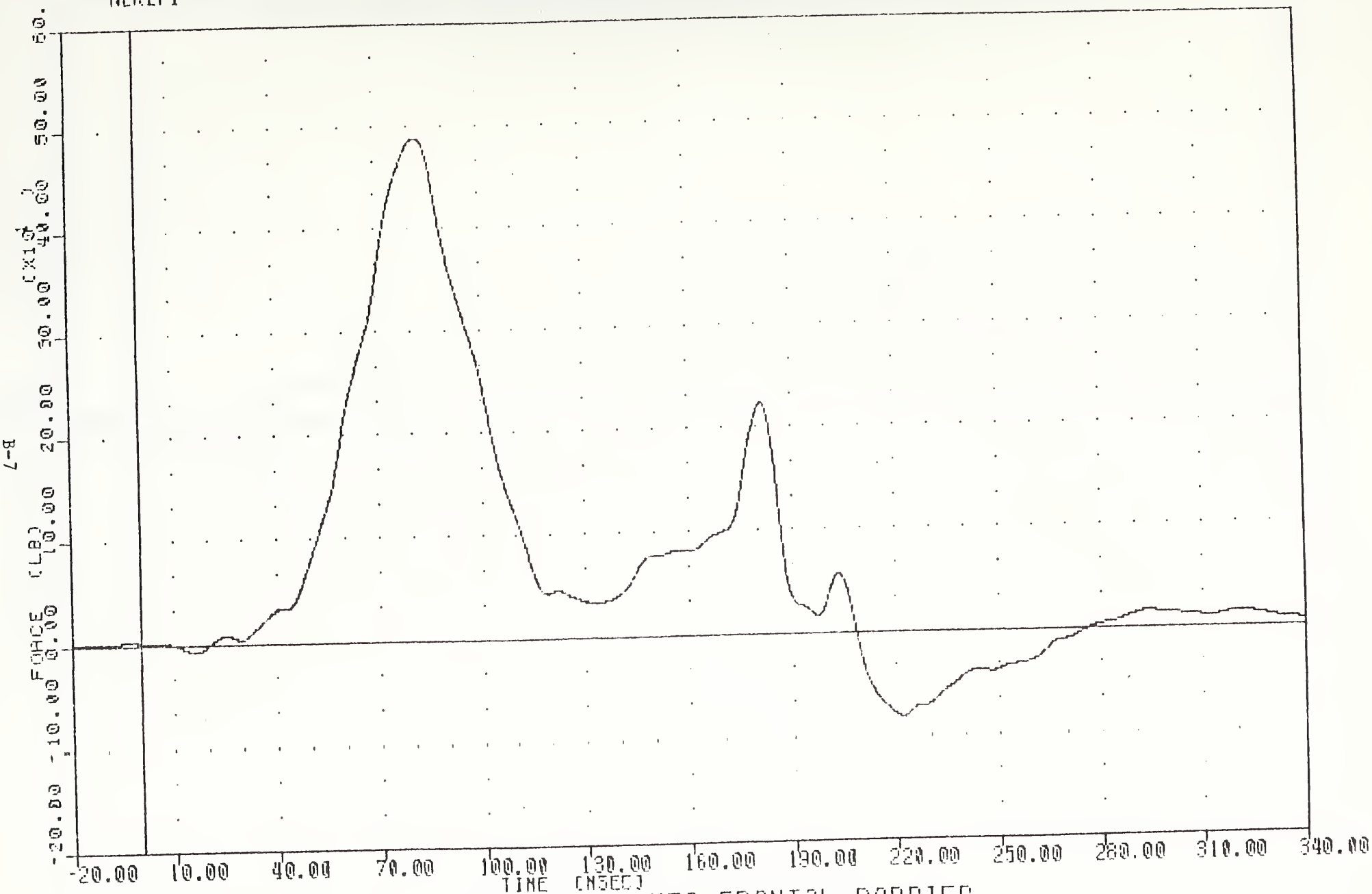
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -43.66@ 189.13 , 379.91 @ 96.50



SUBARU XT INTO FRONTAL BARRIER
DRIVER NECK FORCE X AXIS LBS (SHEAR)

TRC . 871013
20B FRONTAL CRASH TEST
87286
NEKZF1

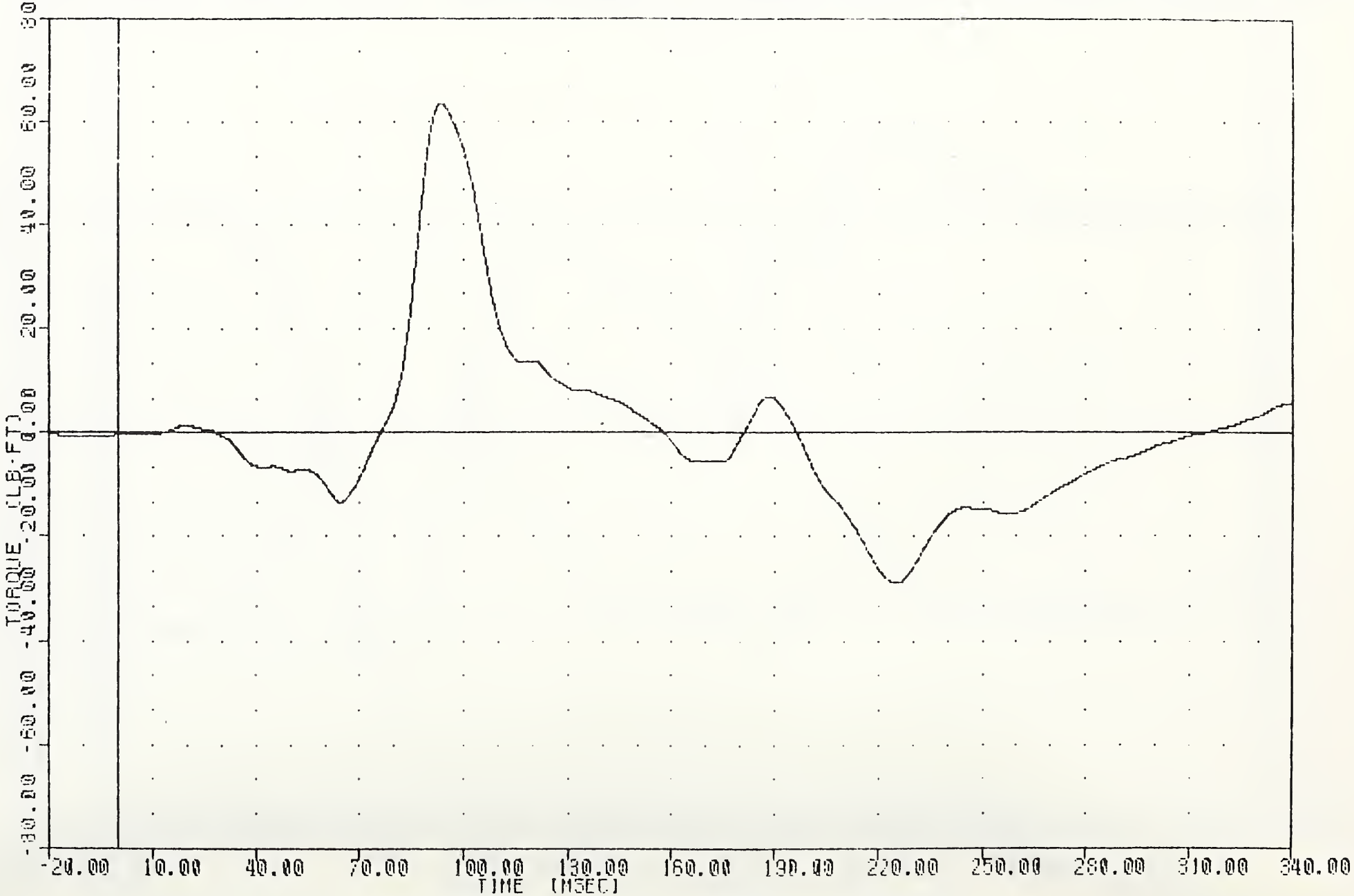
FILTER = BLPF 100/ 250/ 16
MIN, MAX VALUES = -83.19@ 221.75 , 487.79 @ 82.25



SUBARU XT INTO FRONTAL BARRIER
DRIVER NECK FORCE Z AXIS LBS (AXIAL)

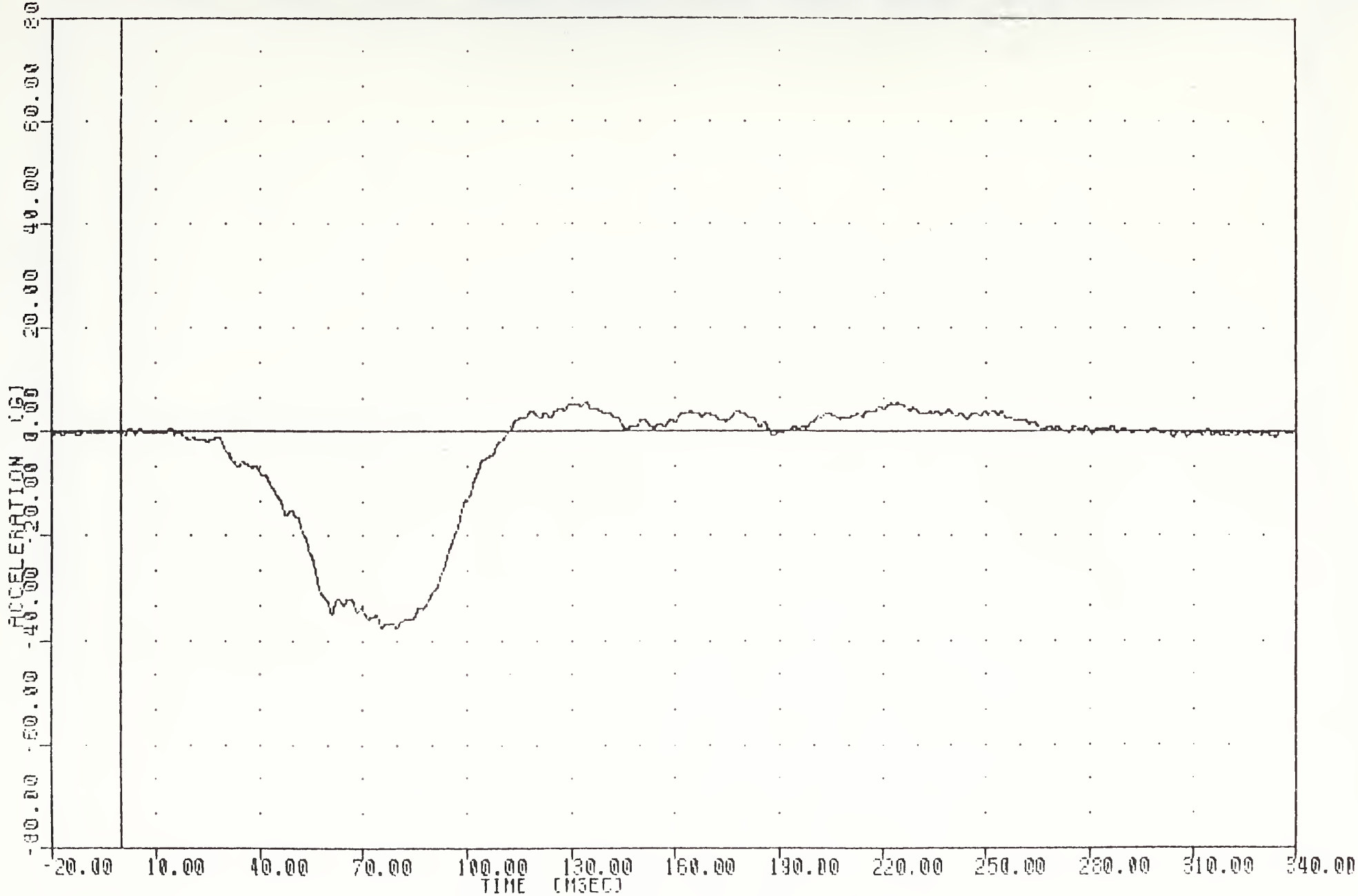
TRC , 871013
200 FRONTAL CRASH TEST
87286
NEKYM1

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -28.91 @ 125.33 , 68.47 @ 93.25



SUBARU XT INTO FRONTAL BARRIER
DRIVER NECK MOMENT Y AXIS FT-LBS

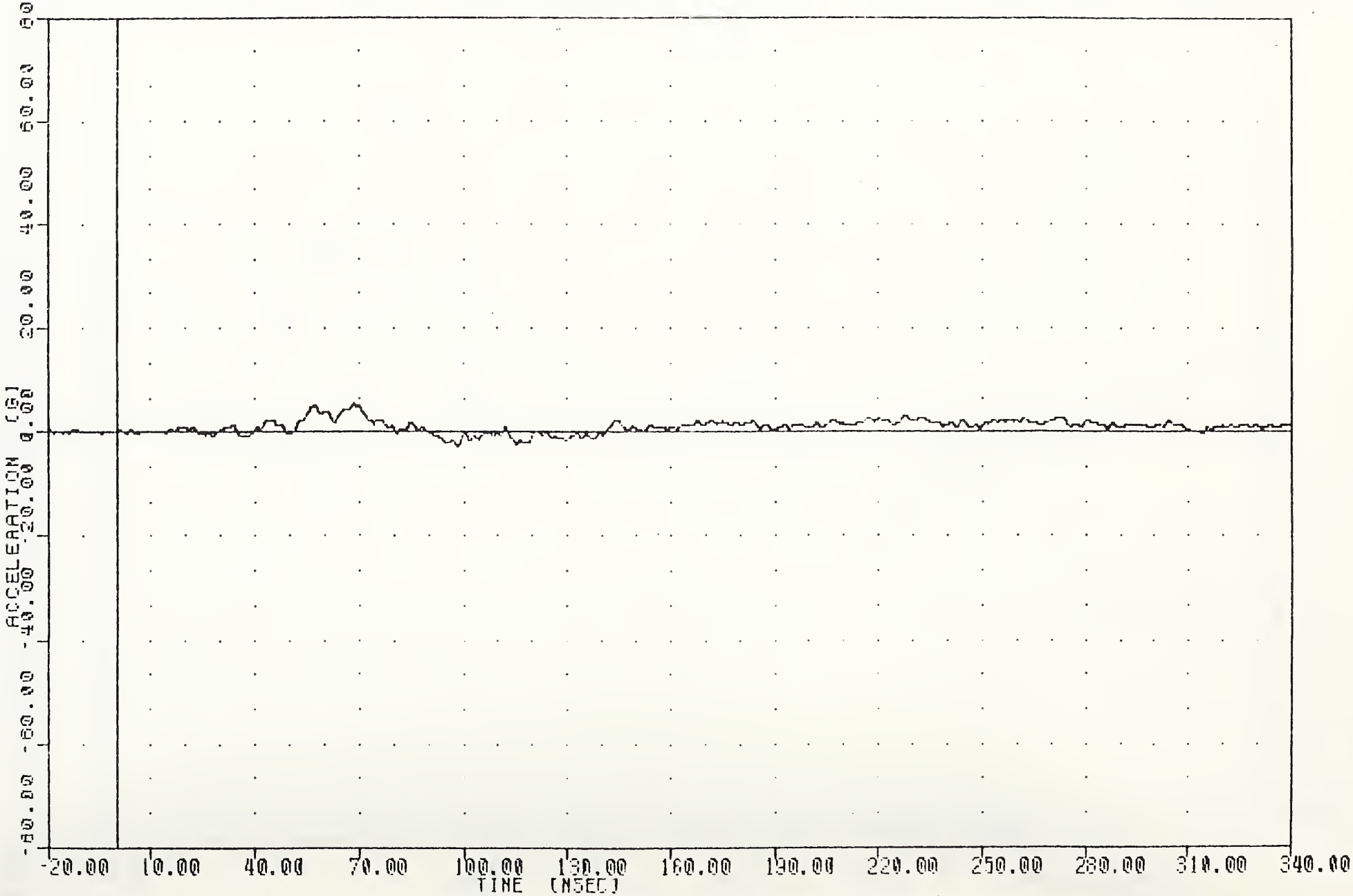
TRC , 871013
208 FRONTAL CRASH TEST
87286 FILTER = BLPF 300/ 750/ -16
CSIXG1 MIN. MAX VALUES = -37.65@ 79.88 , 5.68 @ 134.13



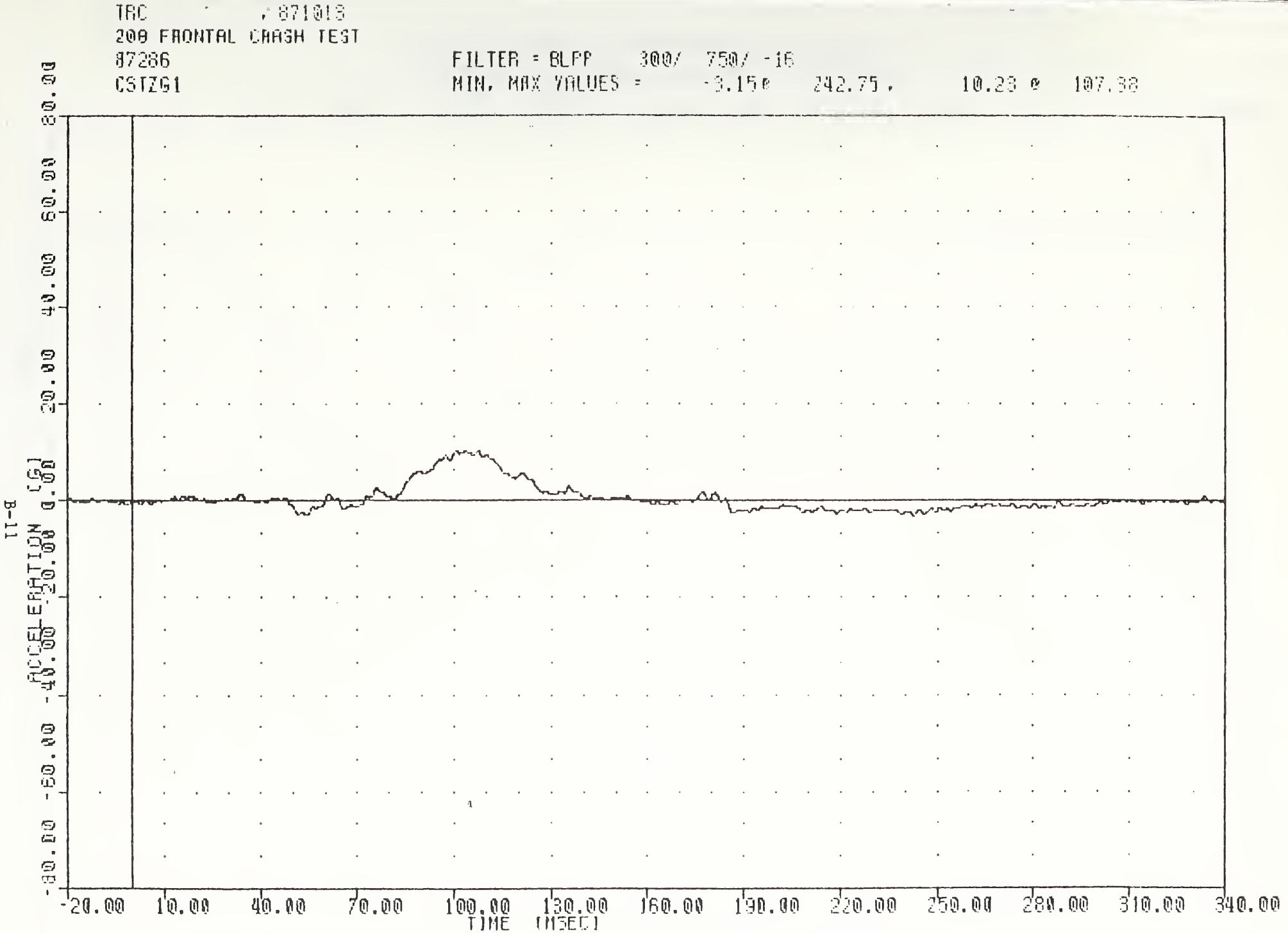
SUBARU XT INTO FRONTAL BARRIER
DRIVER CHEST X AXIS ACCELERATION

TAC , 871013
200 FRONTAL CRASH TEST
87286
CSTY61

FILTER = BLPP 300/ 750/ -18
MIN, MAX VALUES = -2.69@ 96.38 , 5.44 @ 68.50



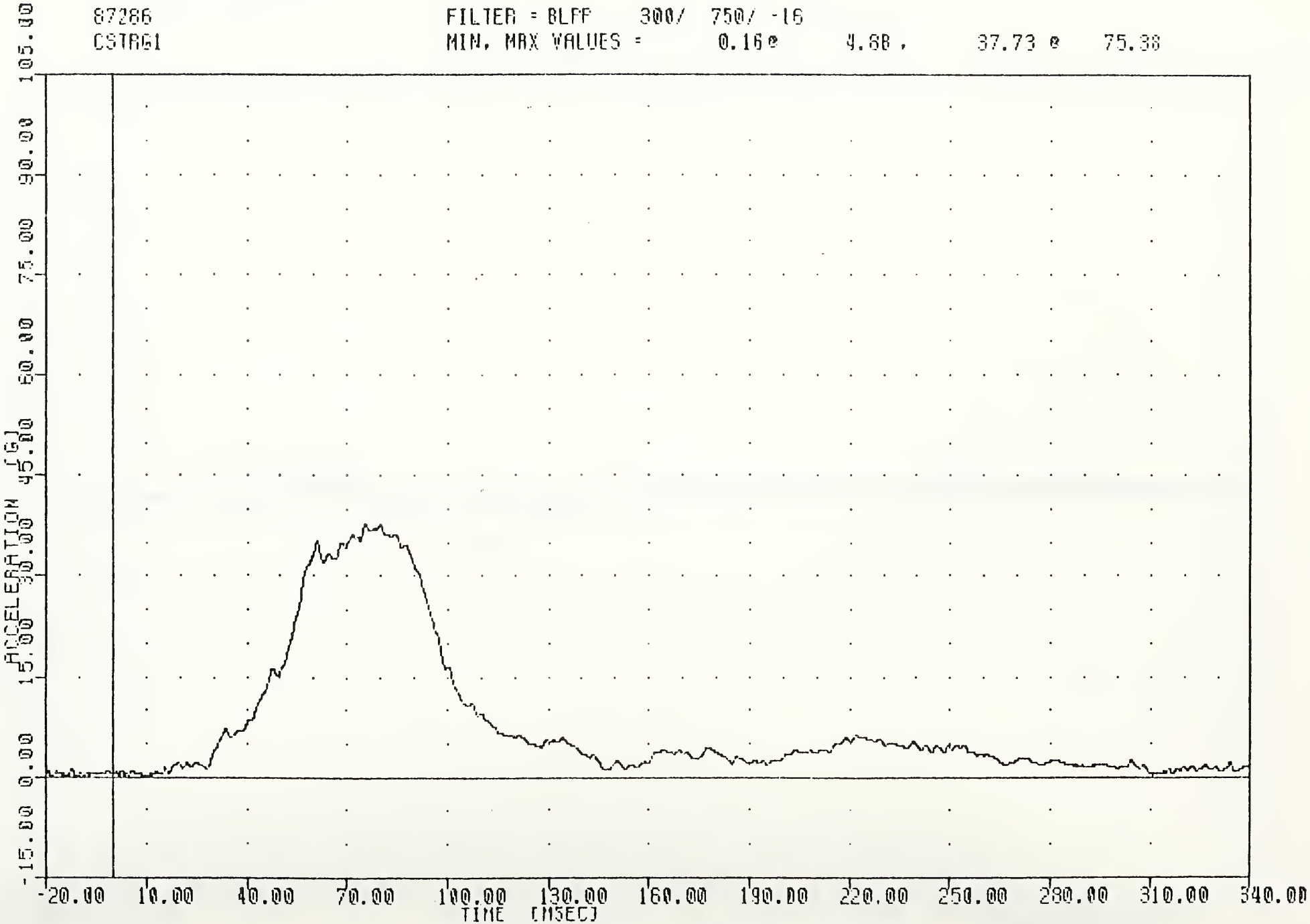
SUBARU XT INTO FRONTAL BARRIER
DRIVER CHEST Y AXIS ACCELERATION



SUBARU XT INTO FRONTAL BARRIER
DRIVER CHEST Z AXIS ACCELERATION

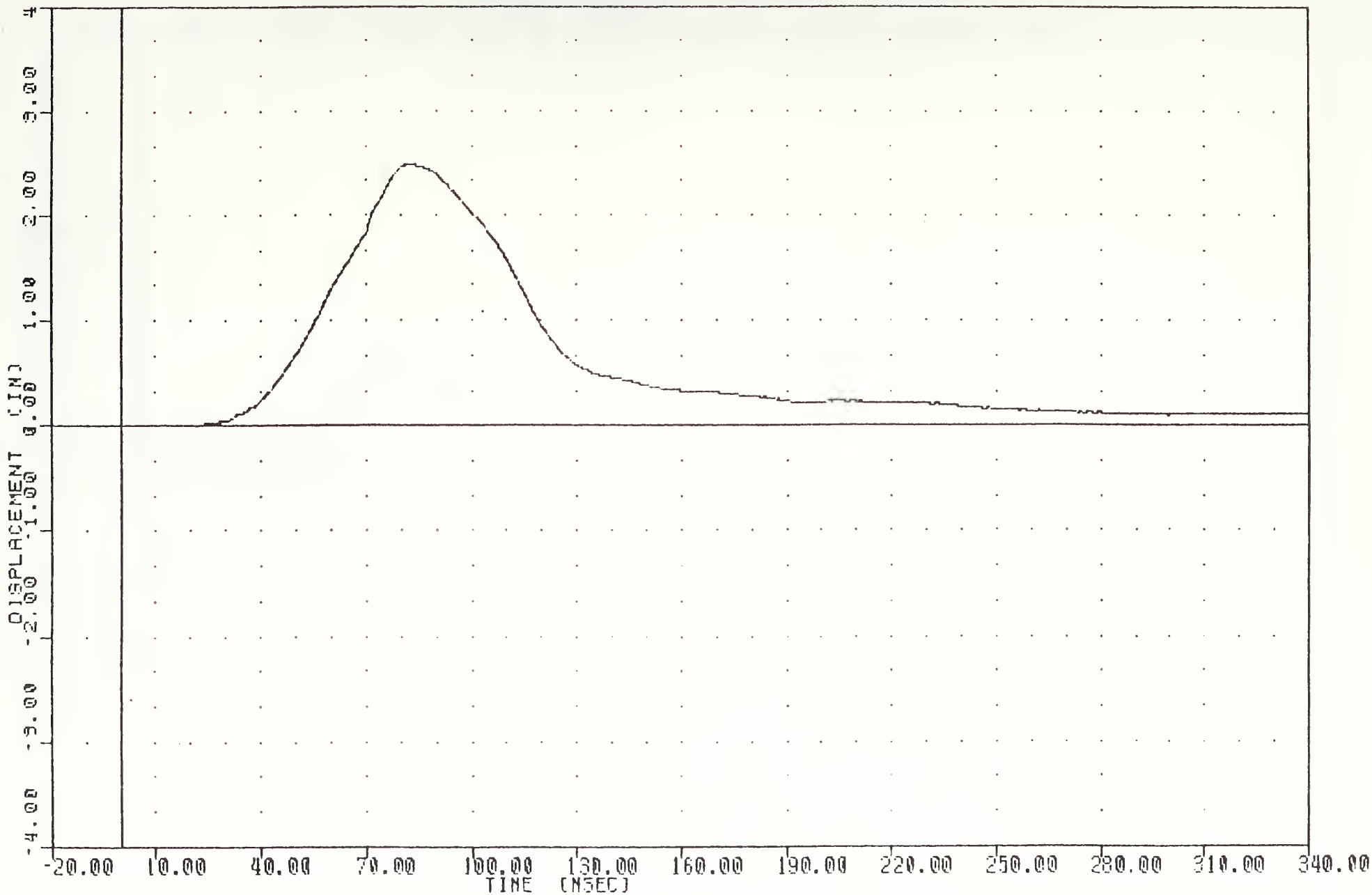
TRC , 871013
209 FRONTAL CRASH TEST
87286
CSTRG1

FILTER = BLFF 300/ 750/ -16
MIN, MAX VALUES = 0.16@ 4.88 , 37.73 @ 75.38

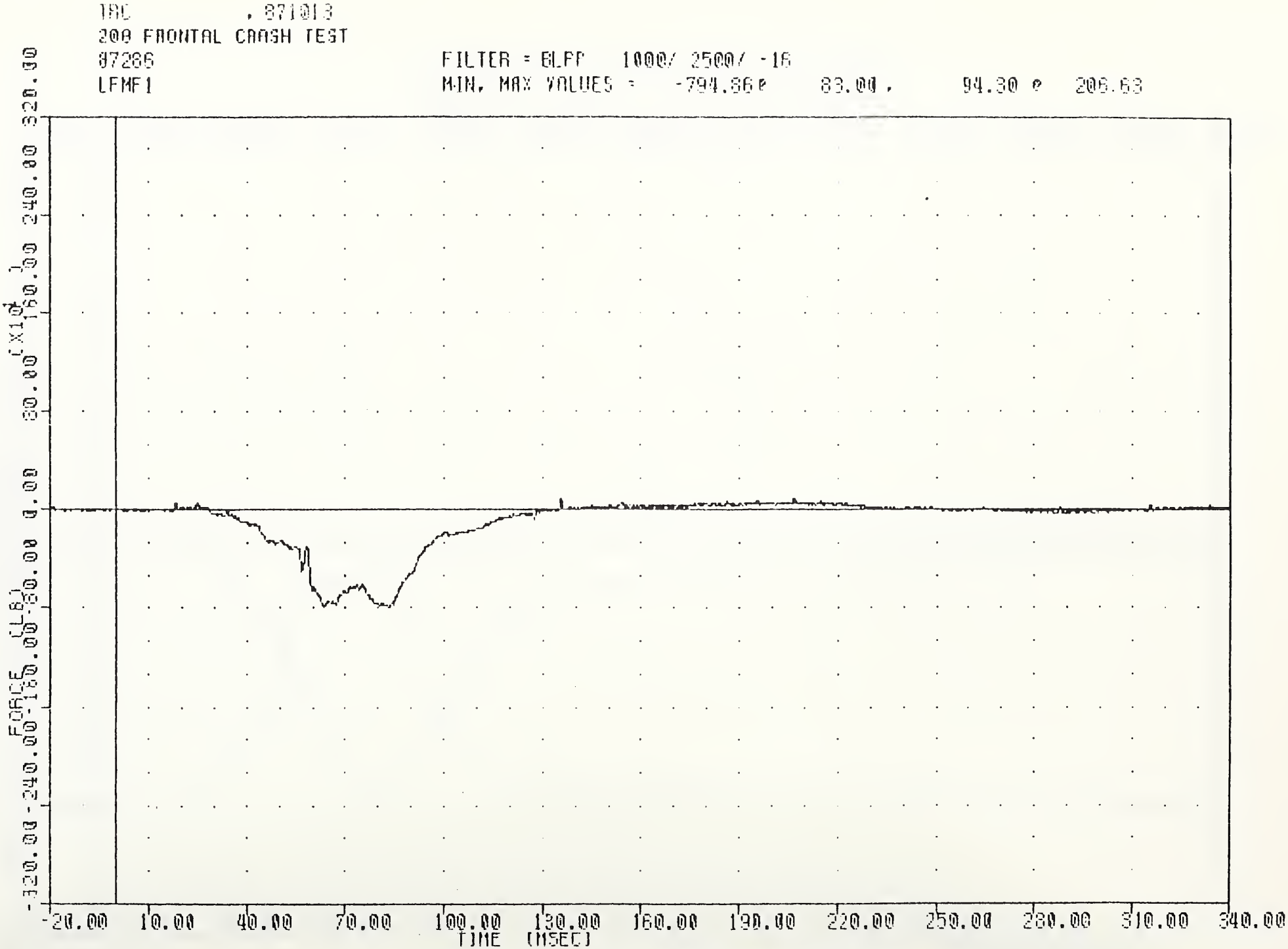


SUBARU XT INTO FRONTAL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TAC , 871013
200 FRONTAL CRASH TEST
87286 FILTER = BLPP 300/ 750/ -16
CSTXD1 MIN. MAX VALUES = 0.00@ 6.13 , 2.48 @ 82.25

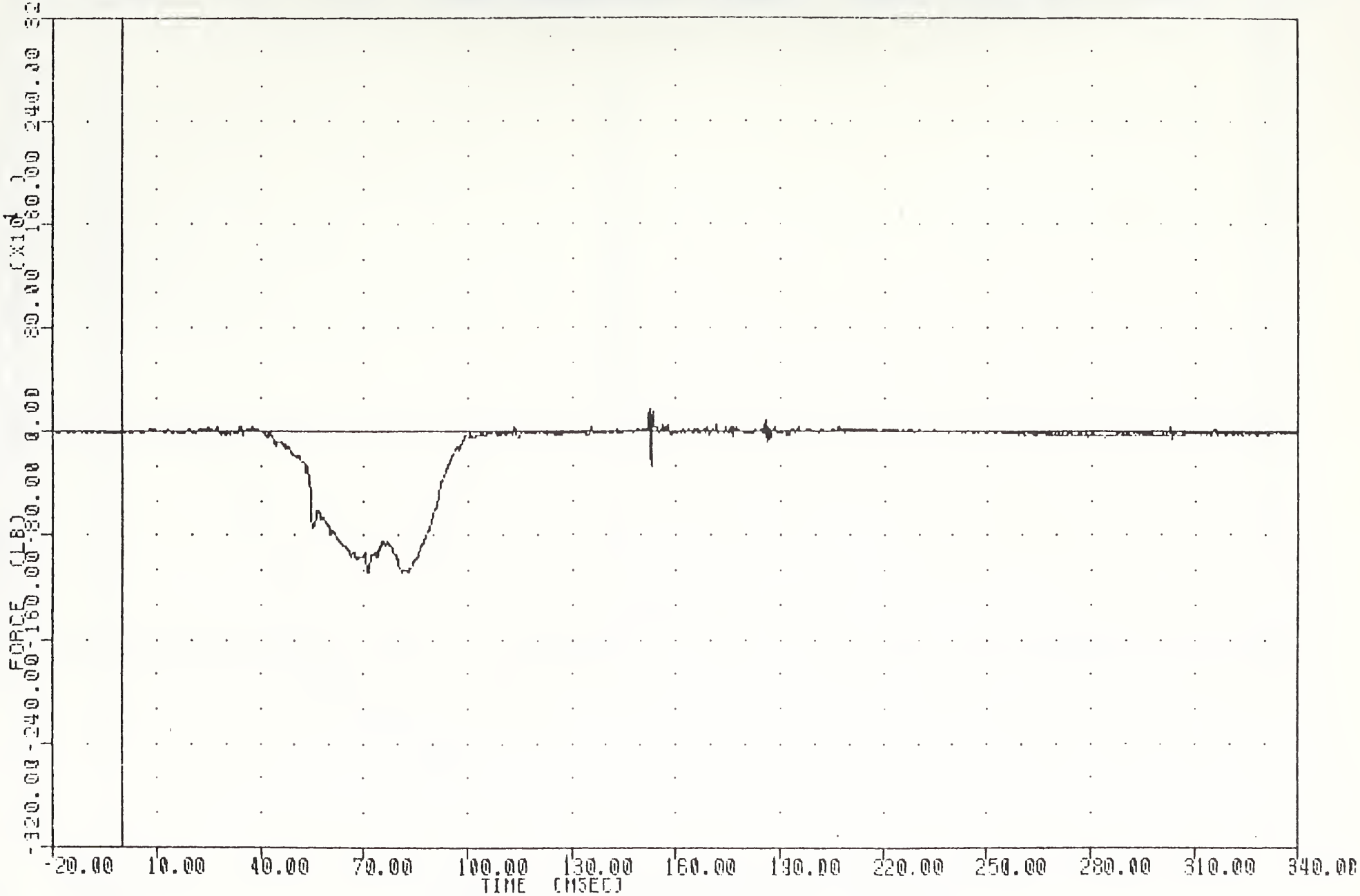


SUBARU XT INTO FRONTAL BARRIER
DRIVER CHEST DISPLACEMENT INCHES



SUBARU XT INTO FRONTAL BARRIER
DRIVER LEFT FEMUR FORCE LBS

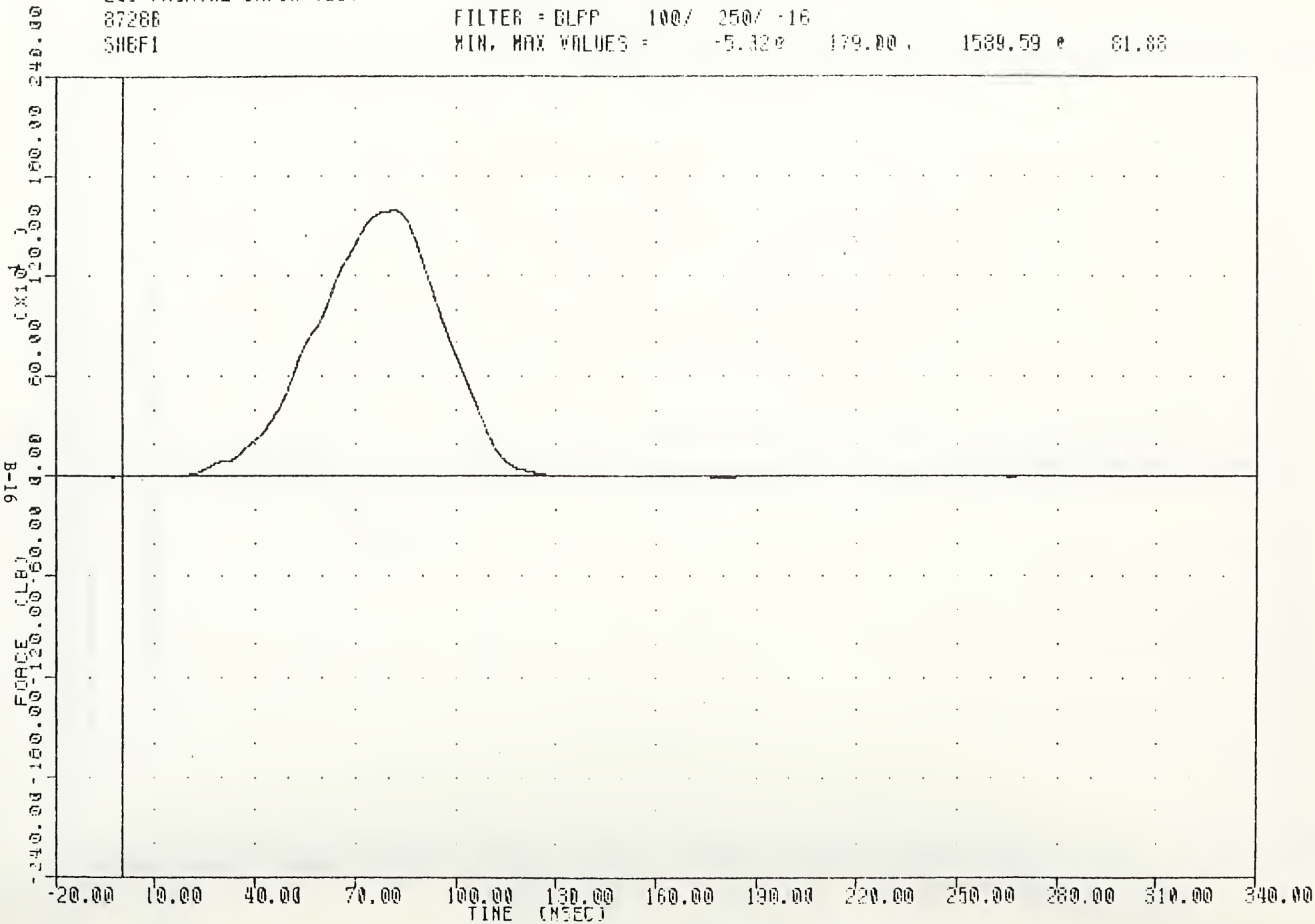
TRC -871013
208 FRONTAL CRASH TEST
87286 FILTER = BLPP 1000/ 2500/ -16
RFMF1 MIN, MAX VALUES = -1081.49@ 83.00 , 180.96 @ 152.25



SUBARU XT INTO FRONTAL BARRIER
DRIVER RIGHT FEMUR FORCE LBS

TRC , 871013
20B FRONTAL CRASH TEST
87286
SNBF1

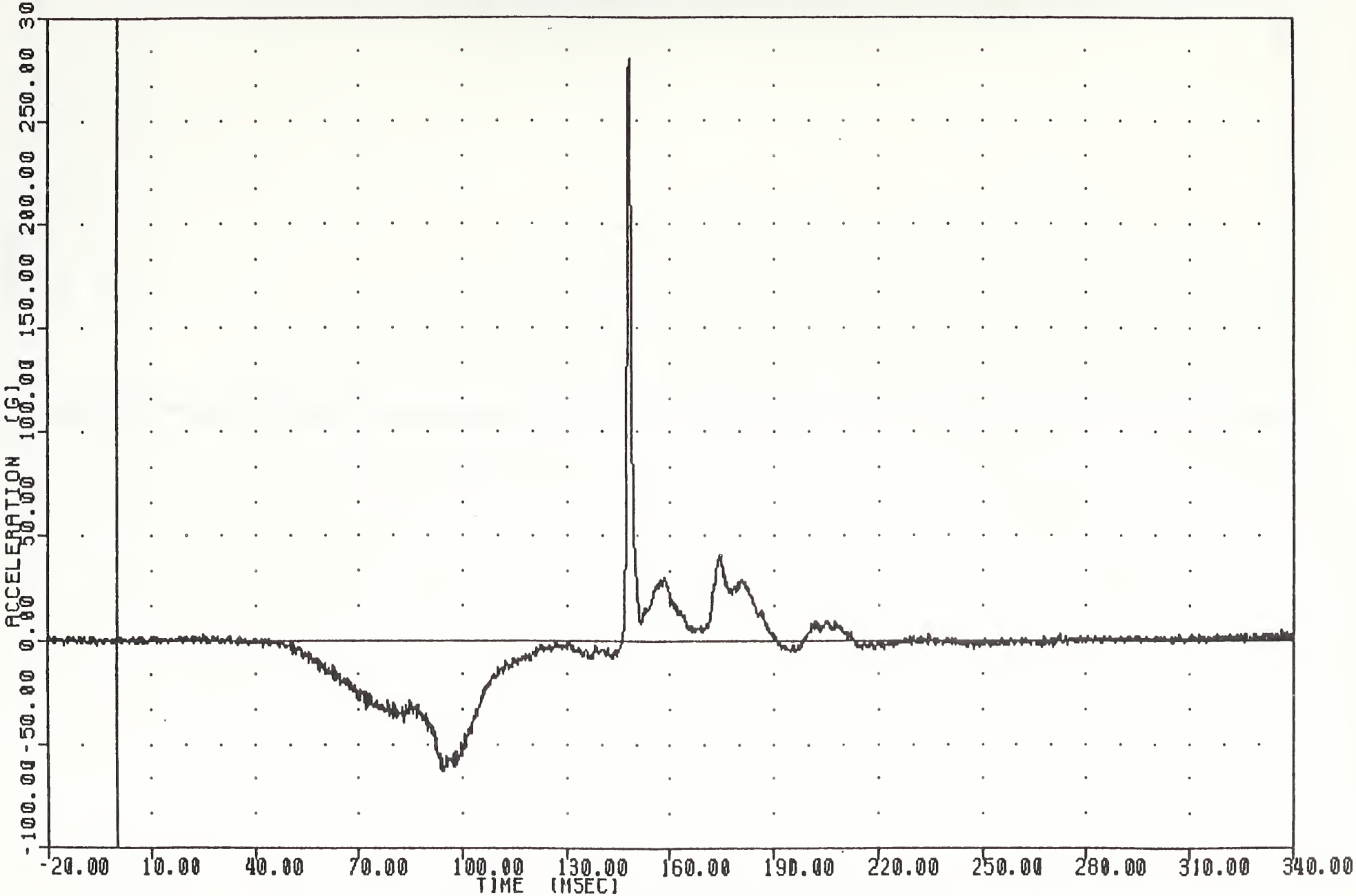
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -5.320 179.00 , 1589.59 @ 81.88



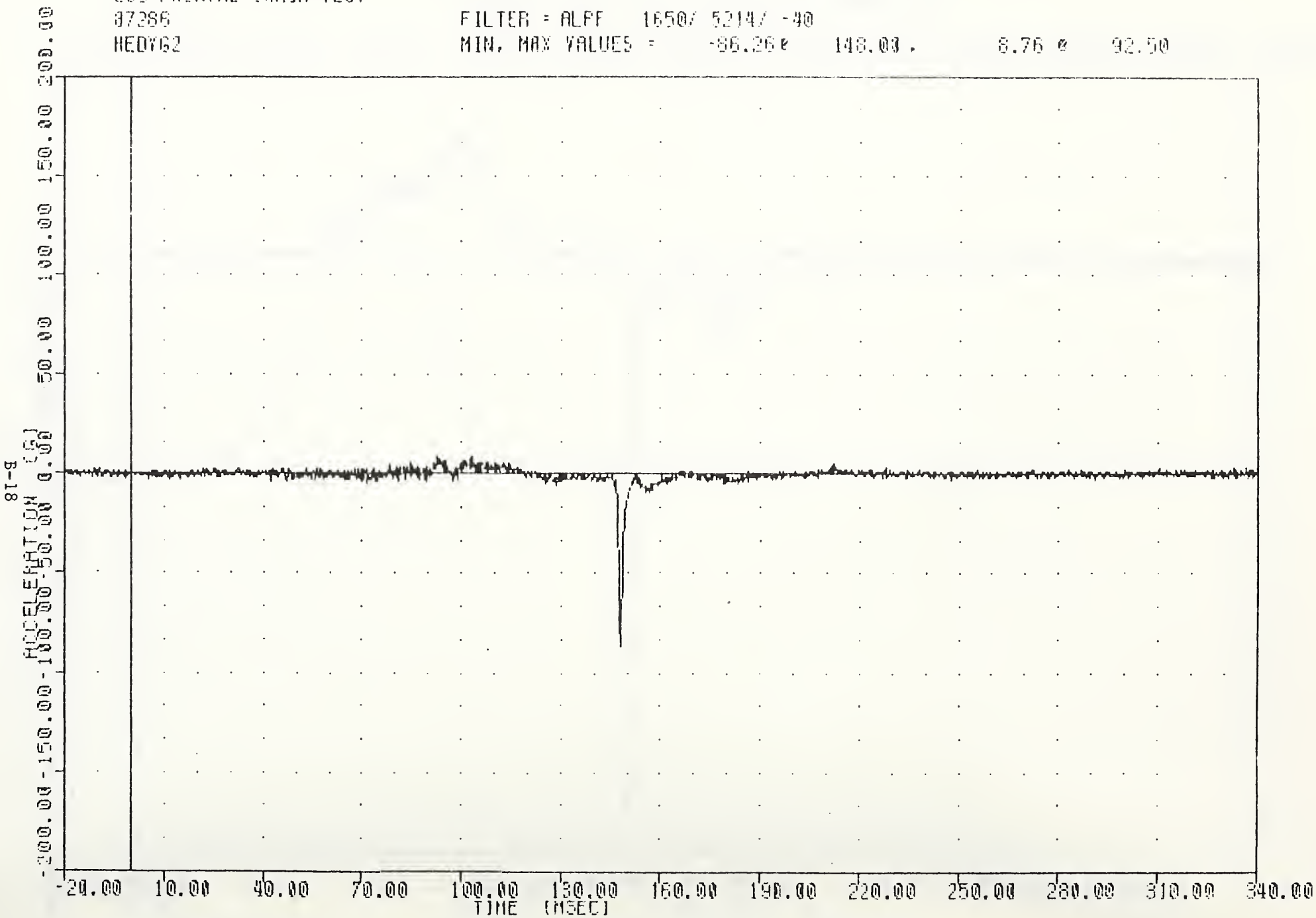
SUBARU XT INTO FRONTAL BARRIER
DRIVER'S PASSIVE BELT INBOARD FORCE LBS

TRC , 871013
200 FRONTAL CRASH TEST
87286
HEDXG2

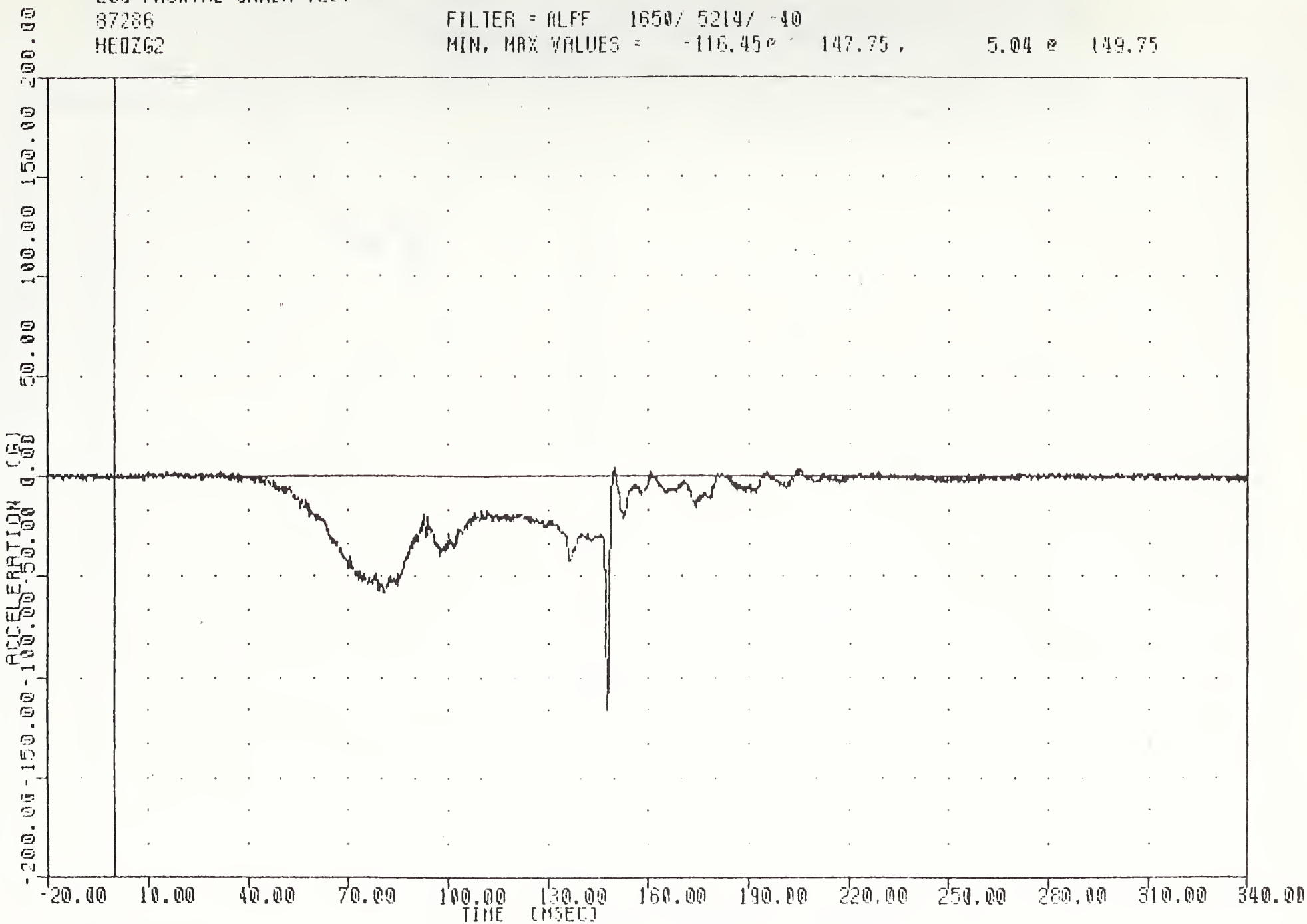
FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -62.98 @ 94.50 , 279.73 @ 147.88



SUBARU XT INTO FRONTAL BARRIER
PASSENGER HEAD X AXIS ACCELERATION

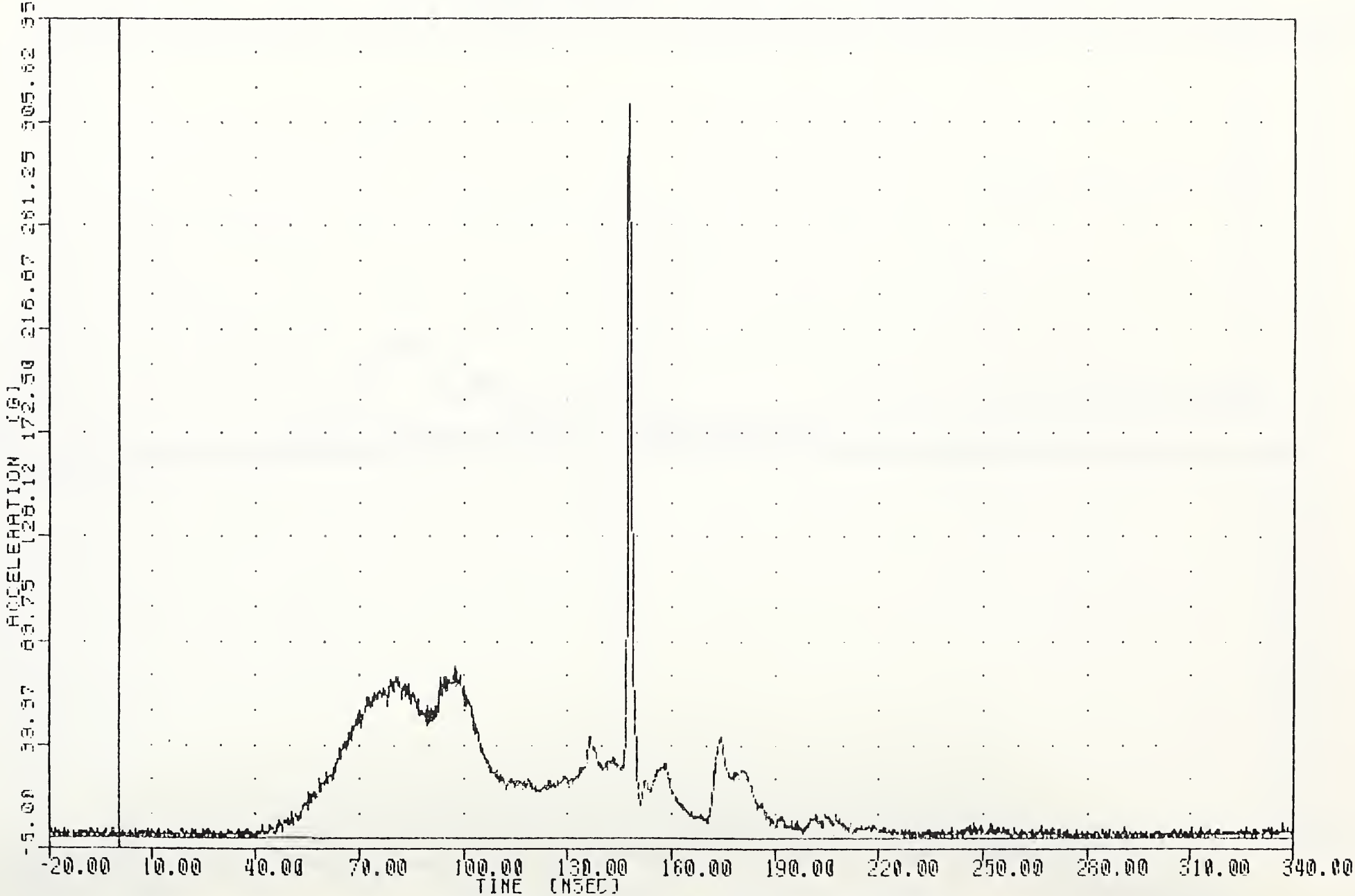


SUBARU XT INTO FRONTAL BARRIER
PASSENGER HEAD Y AXIS ACCELERATION

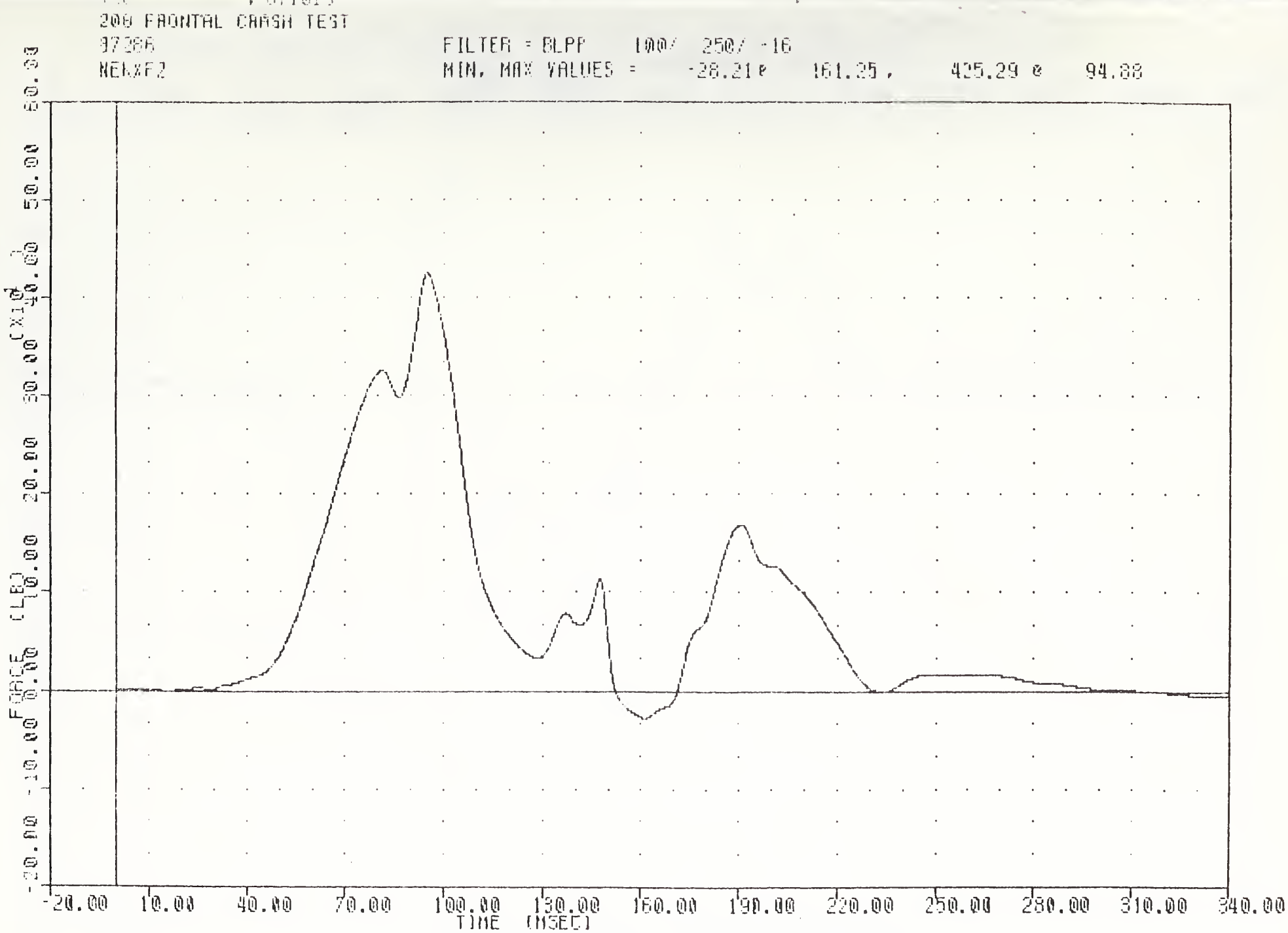


SUBARU XT INTO FRONTAL BARRIER
PASSENGER HEAD Z AXIS ACCELERATION

TAC , 871013
200 FRONTAL CRASH TEST
87286 FILTER = ALFF 1650/ 5214/ -40
HEDR62 MIN, MAX VALUES = 0.060 0.00 , 313.32 @ 147.88



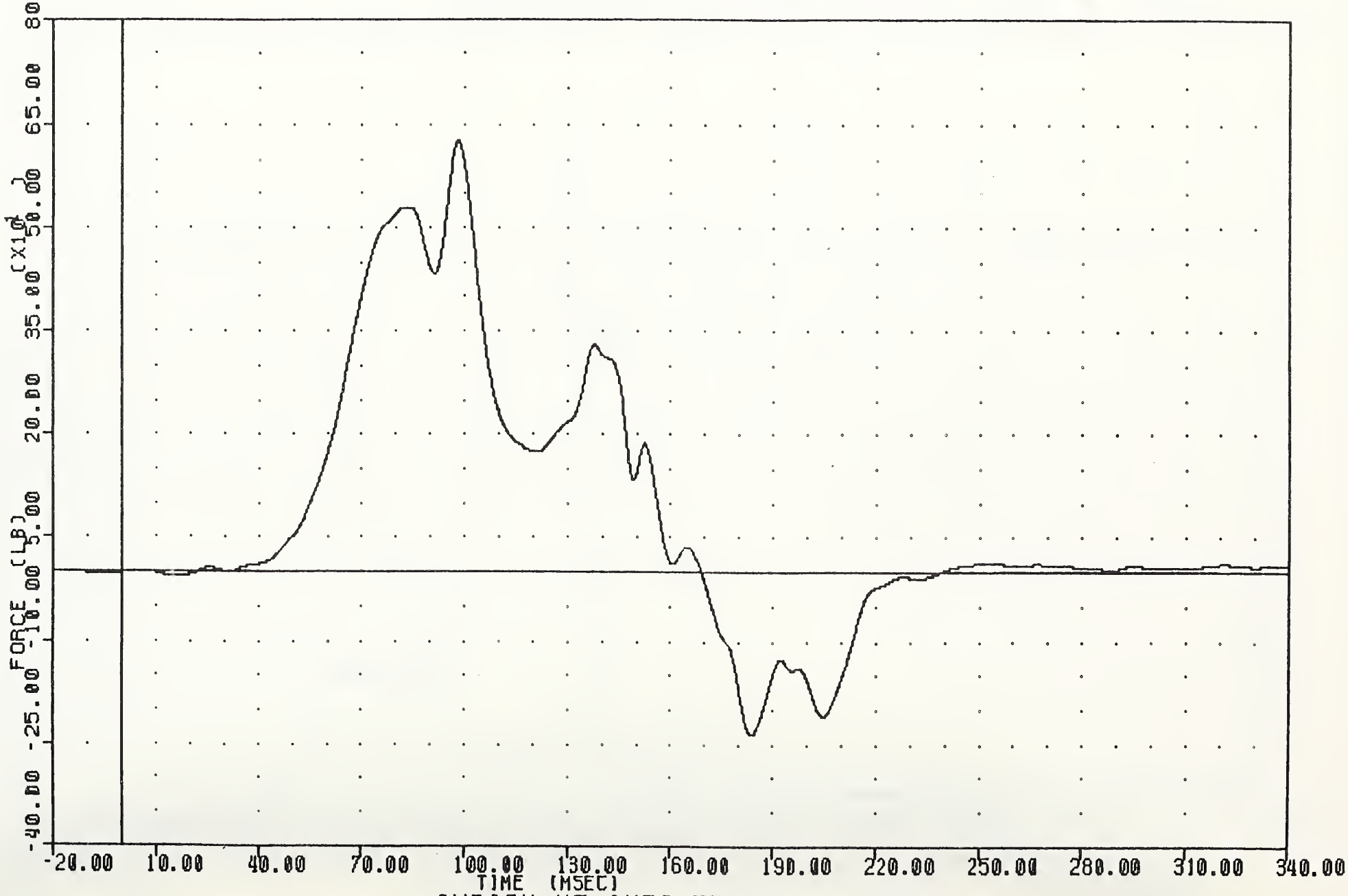
SUBARU XT INTO FRONTAL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION



SUBARU XT INTO FRONTAL BARRIER
PASSENGER NECK FORCE X AXIS LBS (SHEAR)

TRC , 871013
200 FRONTAL CRASH TEST
87286
NEKZF2

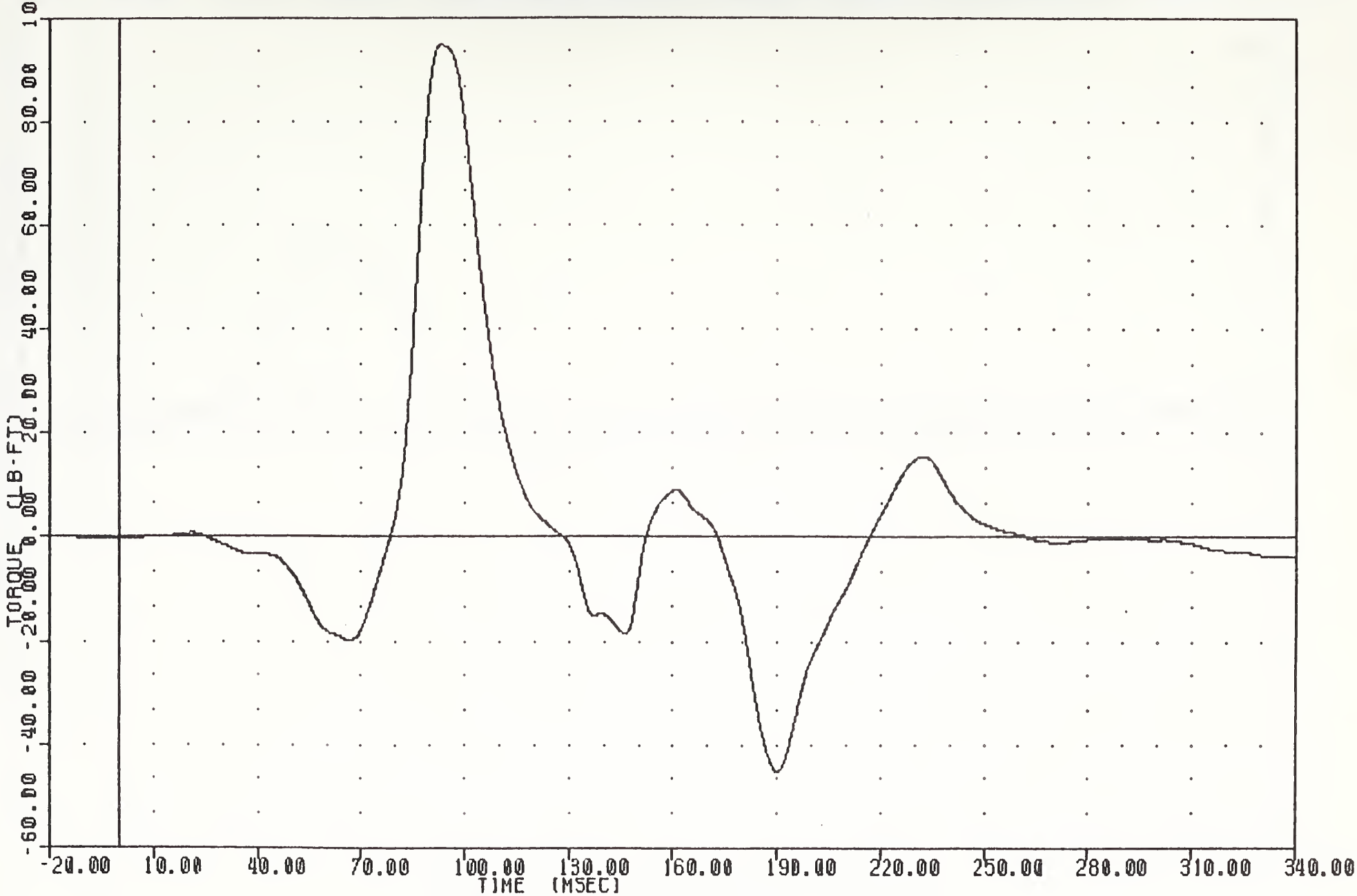
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -235.65 @ 183.63 , 626.82 @ 98.00



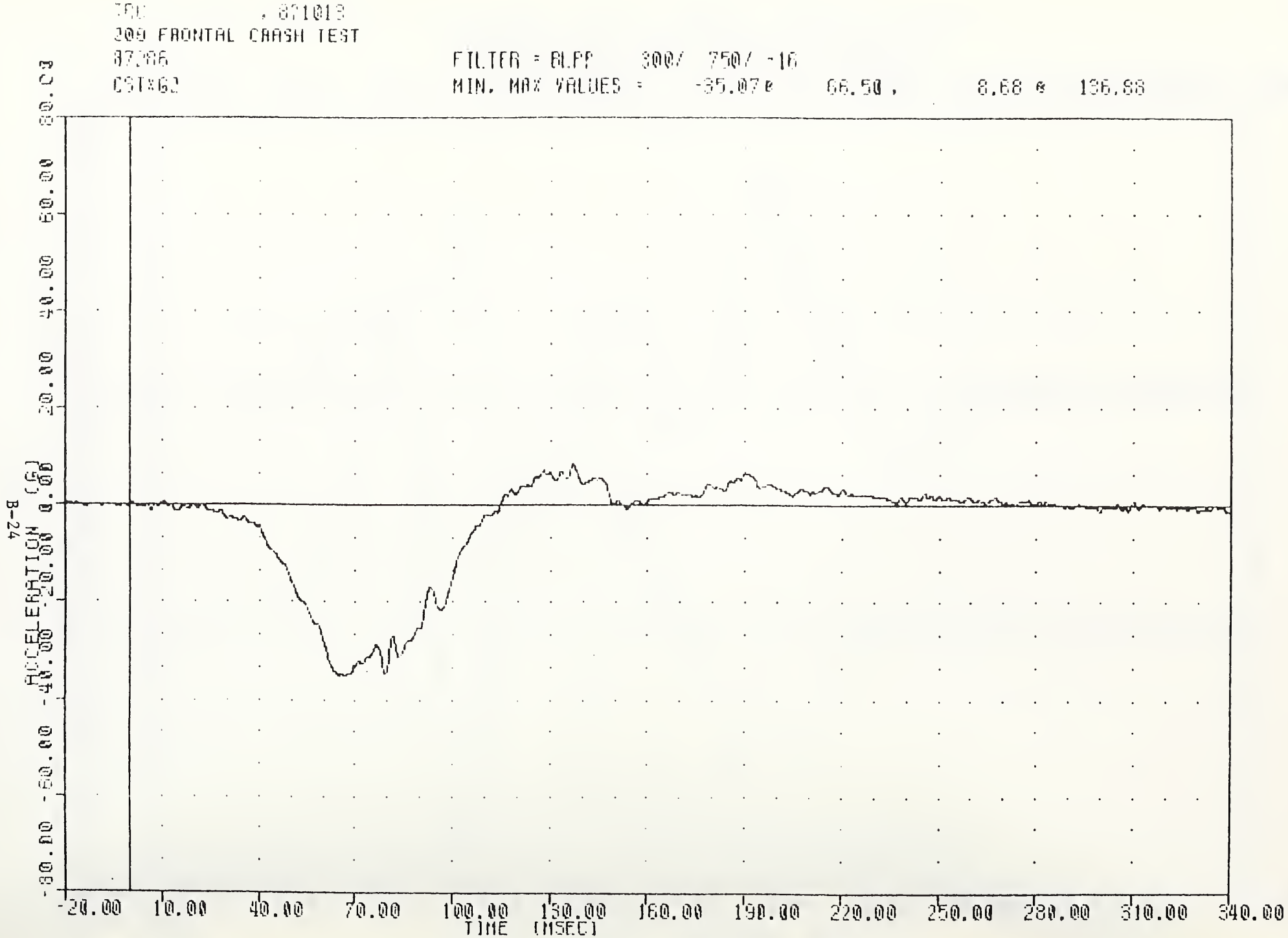
SUBARU XT INTO FRONTAL BARRIER
PASSENGER NECK FORCE Z AXIS LBS (AXIAL)

TRC , 871013
200 FRONTAL CRASH TEST
87286
NEKYM2

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -45.12 @ 190.13 , 94.66 @ 93.00



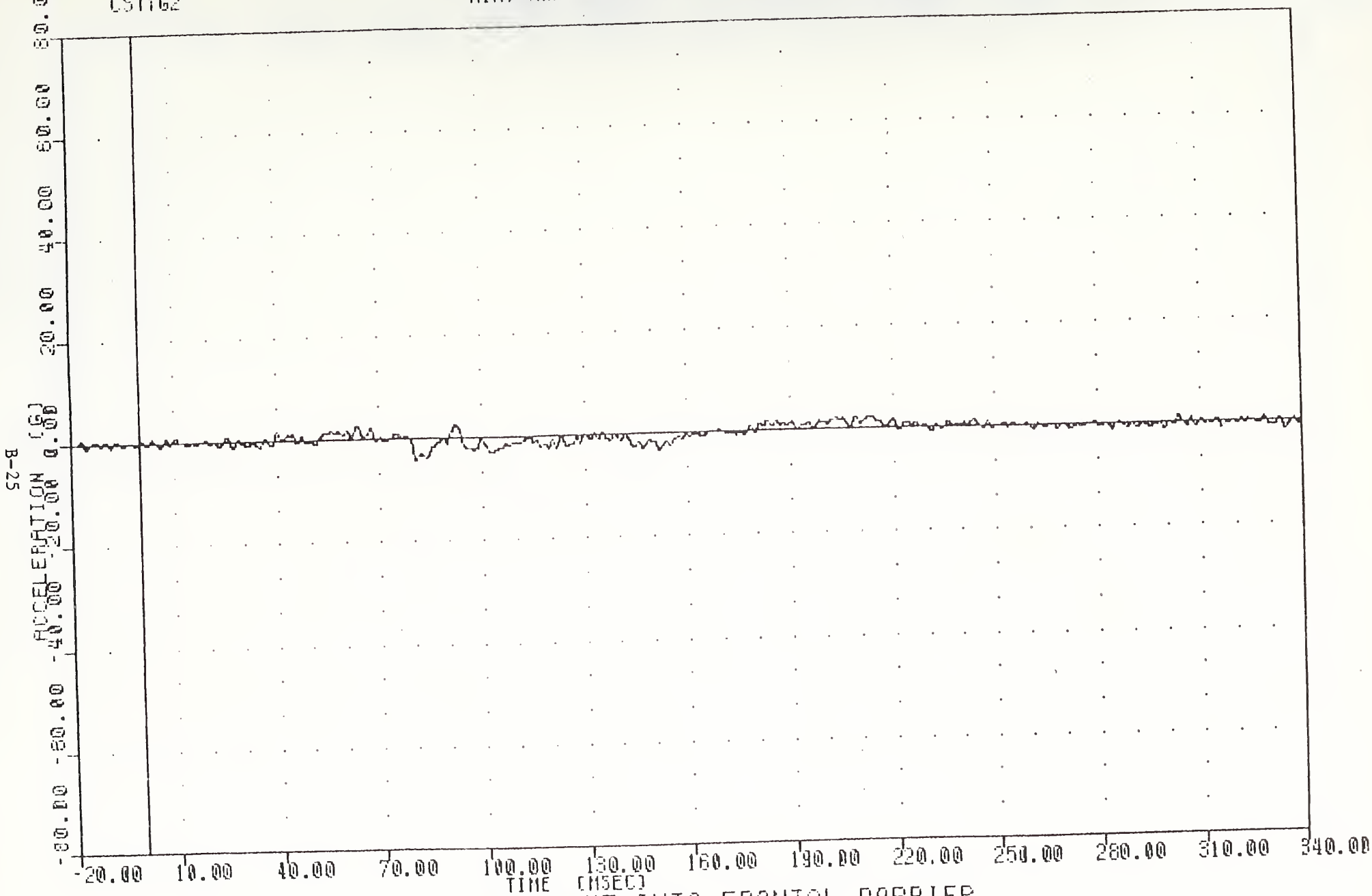
SUBARU XT INTO FRONTAL BARRIER
PASSENGER NECK MOMENT Y AXIS FT-LBS



SUBARU XT INTO FRONTAL BARRIER
PASSENGER CHEST X AXIS ACCELERATION

TBC , 871013
208 FRONTAL CRASH TEST
87286
CSTYG2

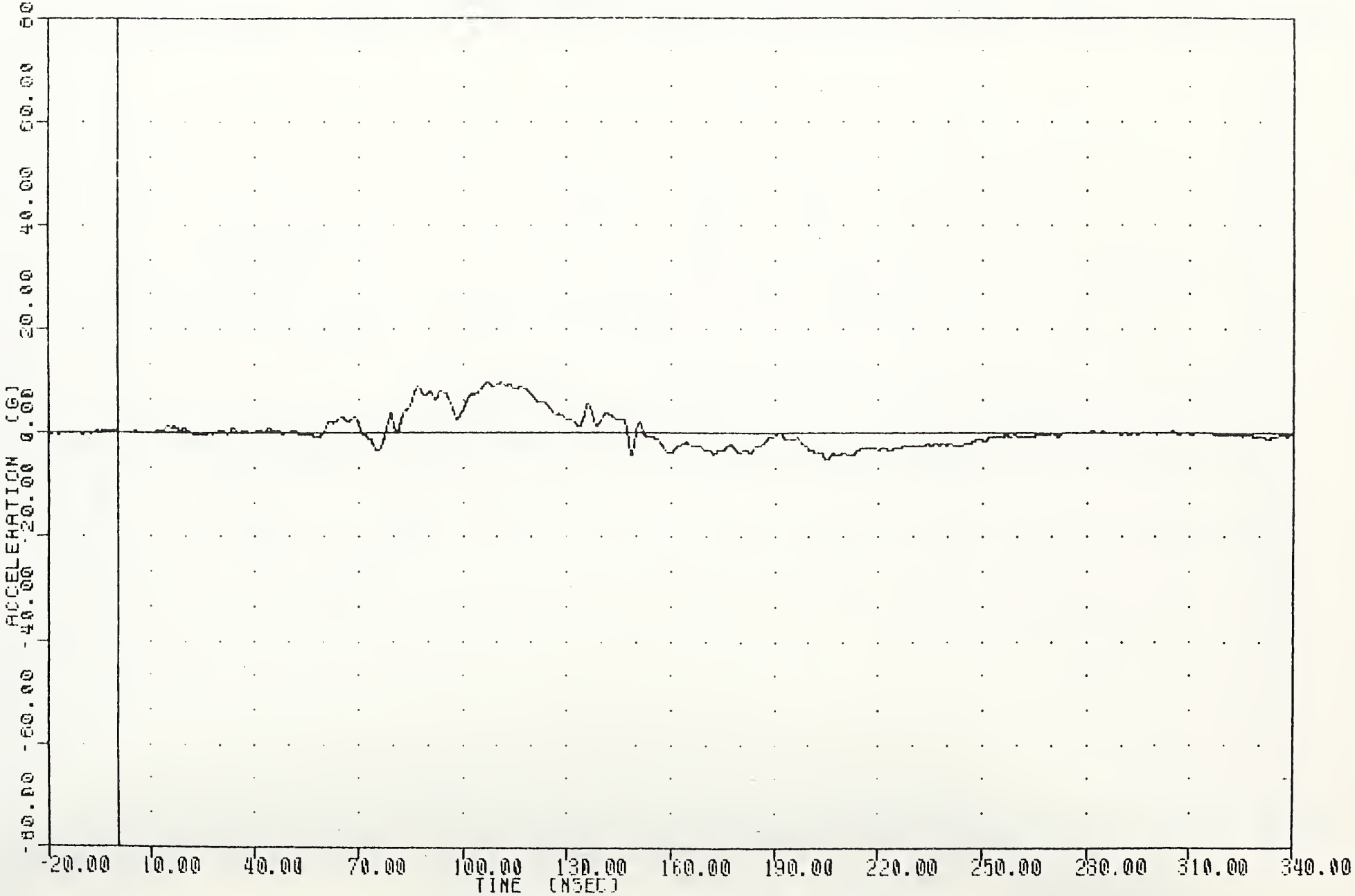
FILTER = BLFP 300/ 750/ -16
MIN, MAX VALUES = -3.96@ 80.75, 2.77 @ 92.25



SUBARU XT INTO FRONTAL BARRIER
PASSENGER CHEST Y AXIS ACCELERATION

TAC , 871013
208 FRONTAL CRASH TEST
87266
CSTZ62

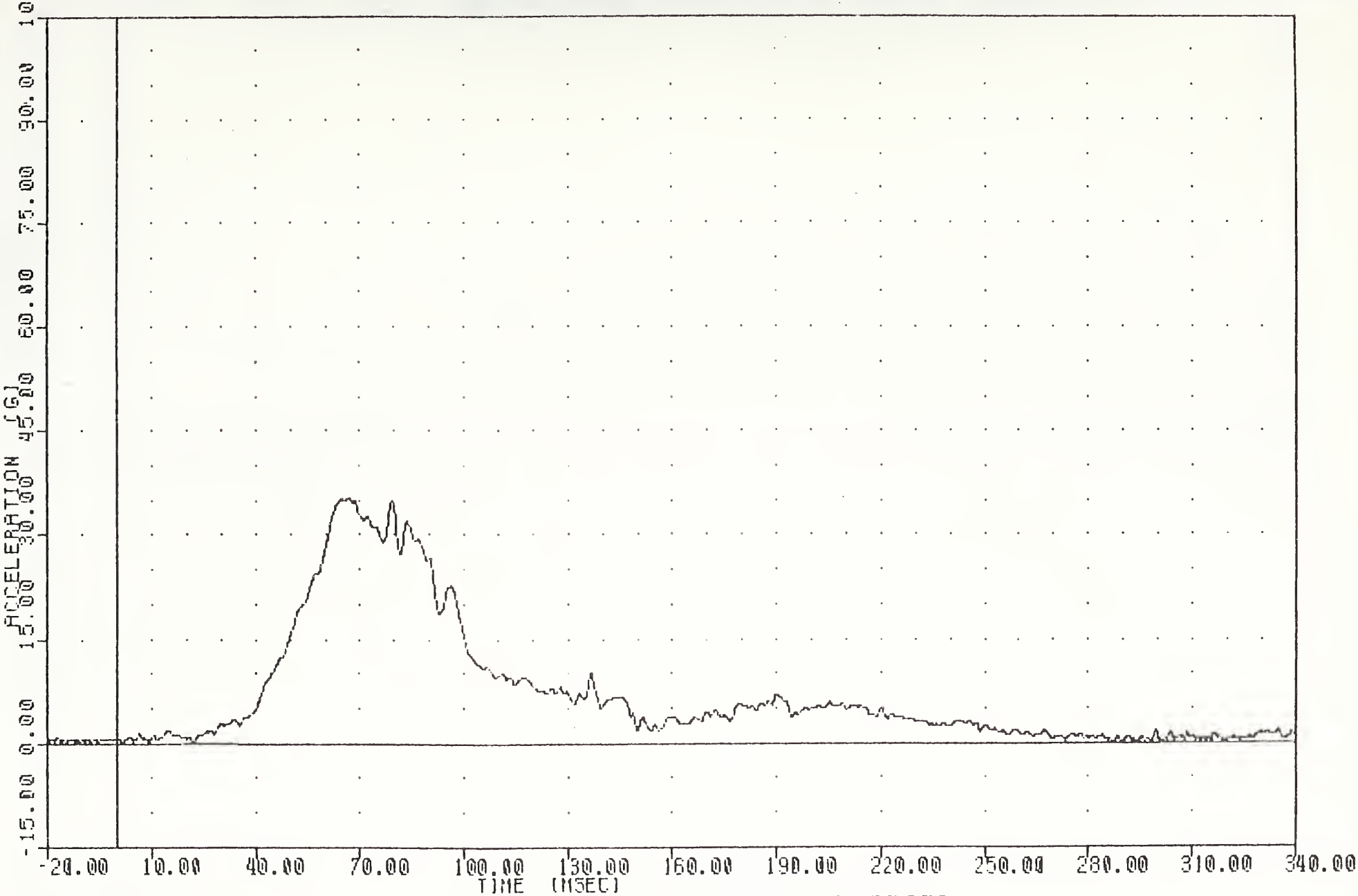
FILTER = BLPP 300/ 750/ -16
MIN, MAX VALUES = -4.89@ 205.00 , 9.99 @ 107.00



SUBARU XT INTO FRONTAL BARRIER
PASSENGER CHEST Z AXIS ACCELERATION

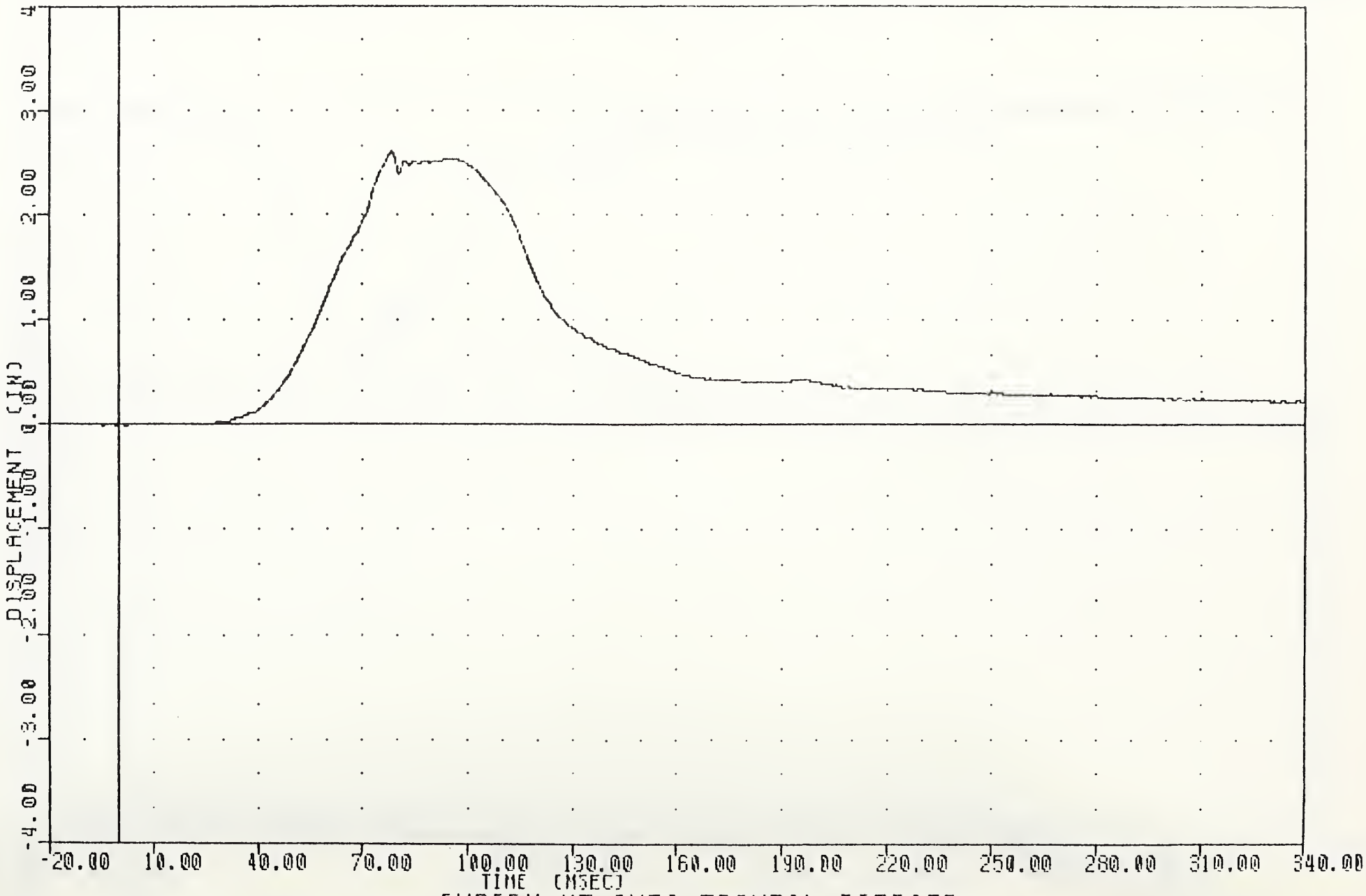
TRC . 871013
200 FRONTAL CRASH TEST
87286
CSTRG2

FILTER = BLPF 300/ 750/ -16
MIN, MAX VALUES = 0.03@ -12.00 , 35.17 @ 66.50



SUBARU XT INTO FRONTAL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION

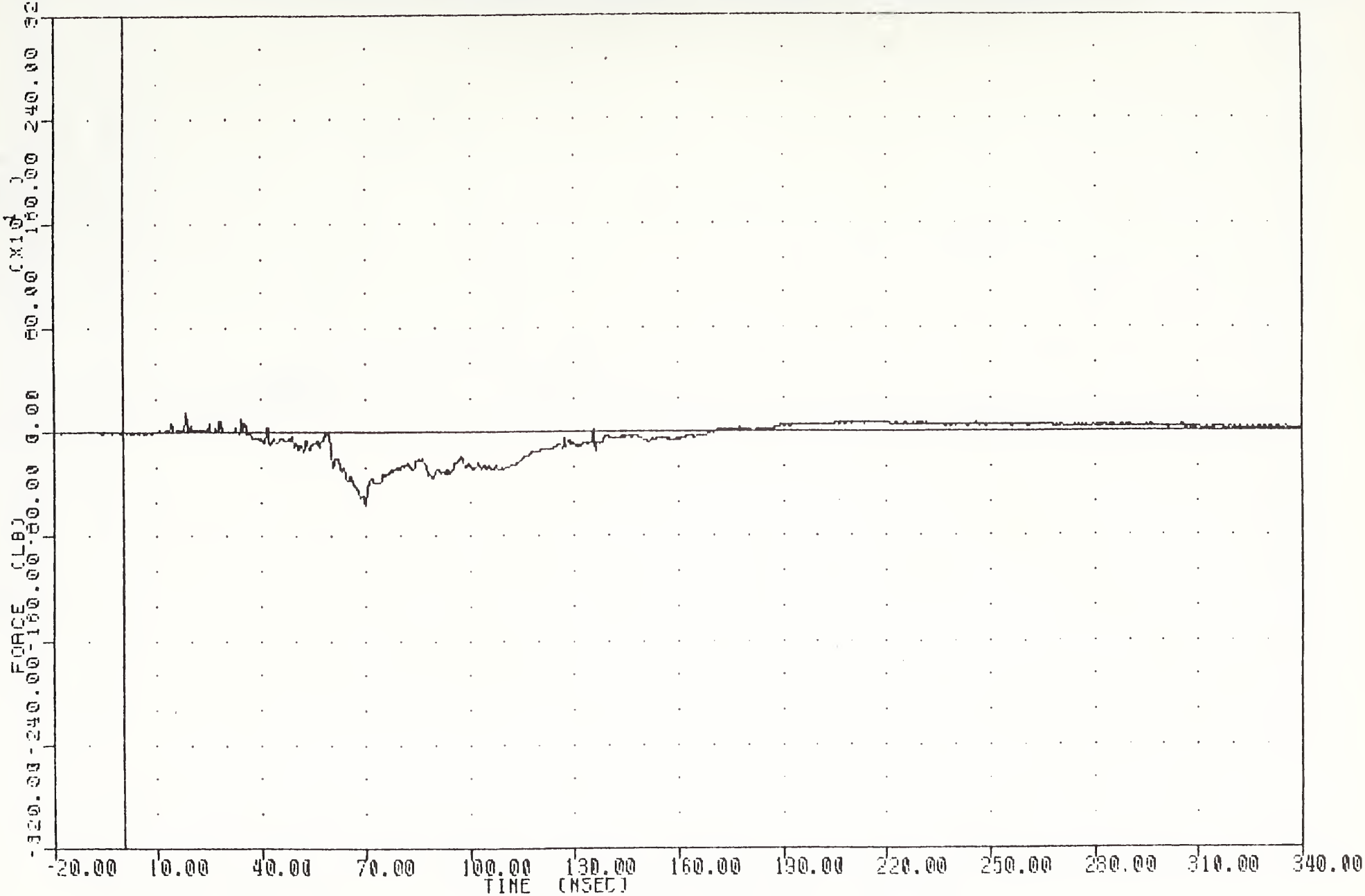
TRC , 871013
200 FRONTAL CRASH TEST
87286 FILTER = BLPF 300/ 750/ -16
CSTXD2 MIN, MAX VALUES = -0.010 2.25 , 2.61 @ 78.38



SUBARU XT INTO FRONTAL BARRIER
PASSENGER CHEST DISPLACEMENT INCHES

TRC , 871013
208 FRONTAL CRASH TEST
87288
LFMF2

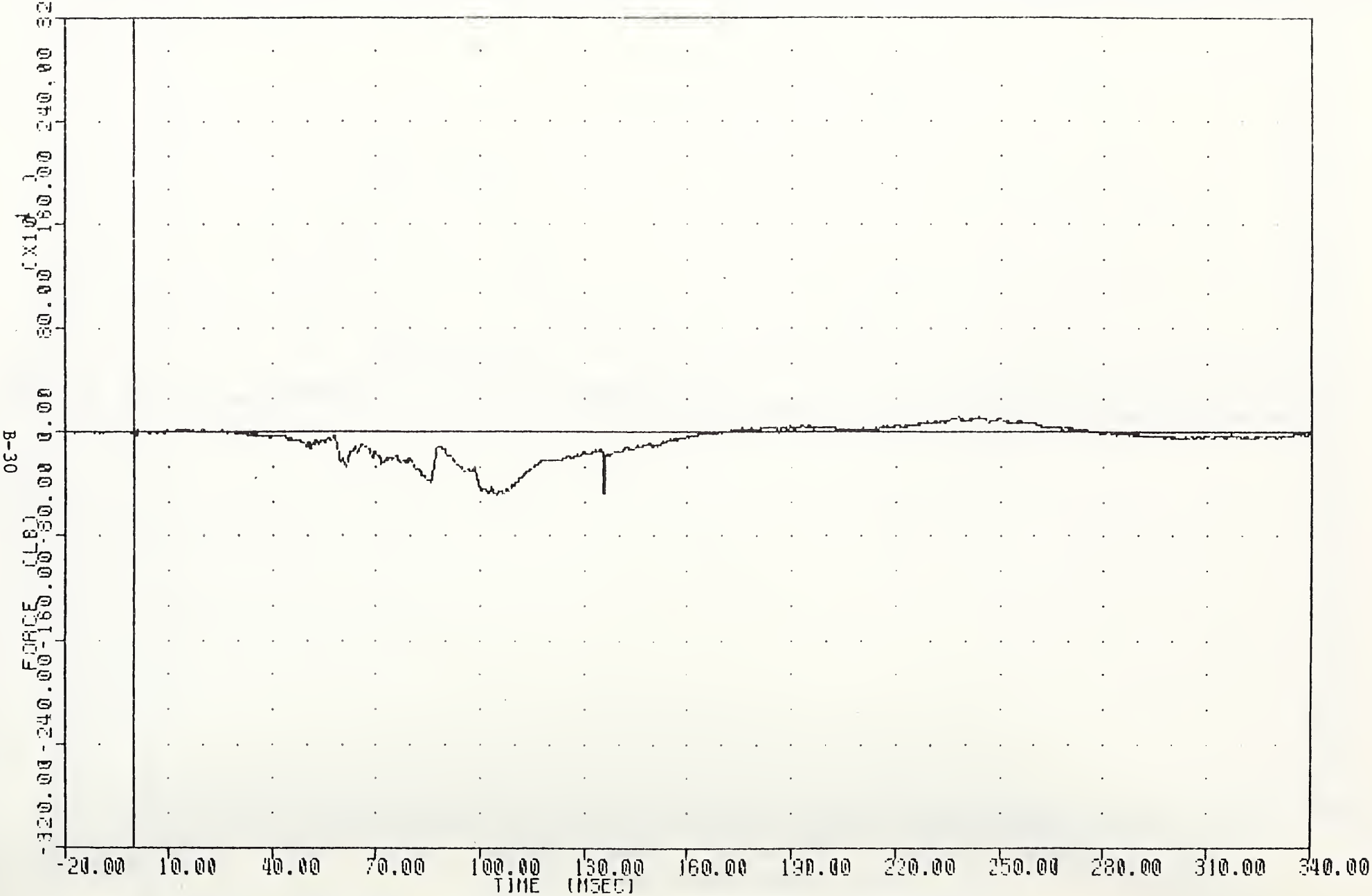
FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -549.91 @ 70.00 , 156.30 @ 16.25



SUBARU XT INTO FRONTAL BARRIER
PASSENGER LEFT FEMUR FORCE LBS

TRC , 871013
208 FRONTAL CRASH TEST
87286
RFMF2

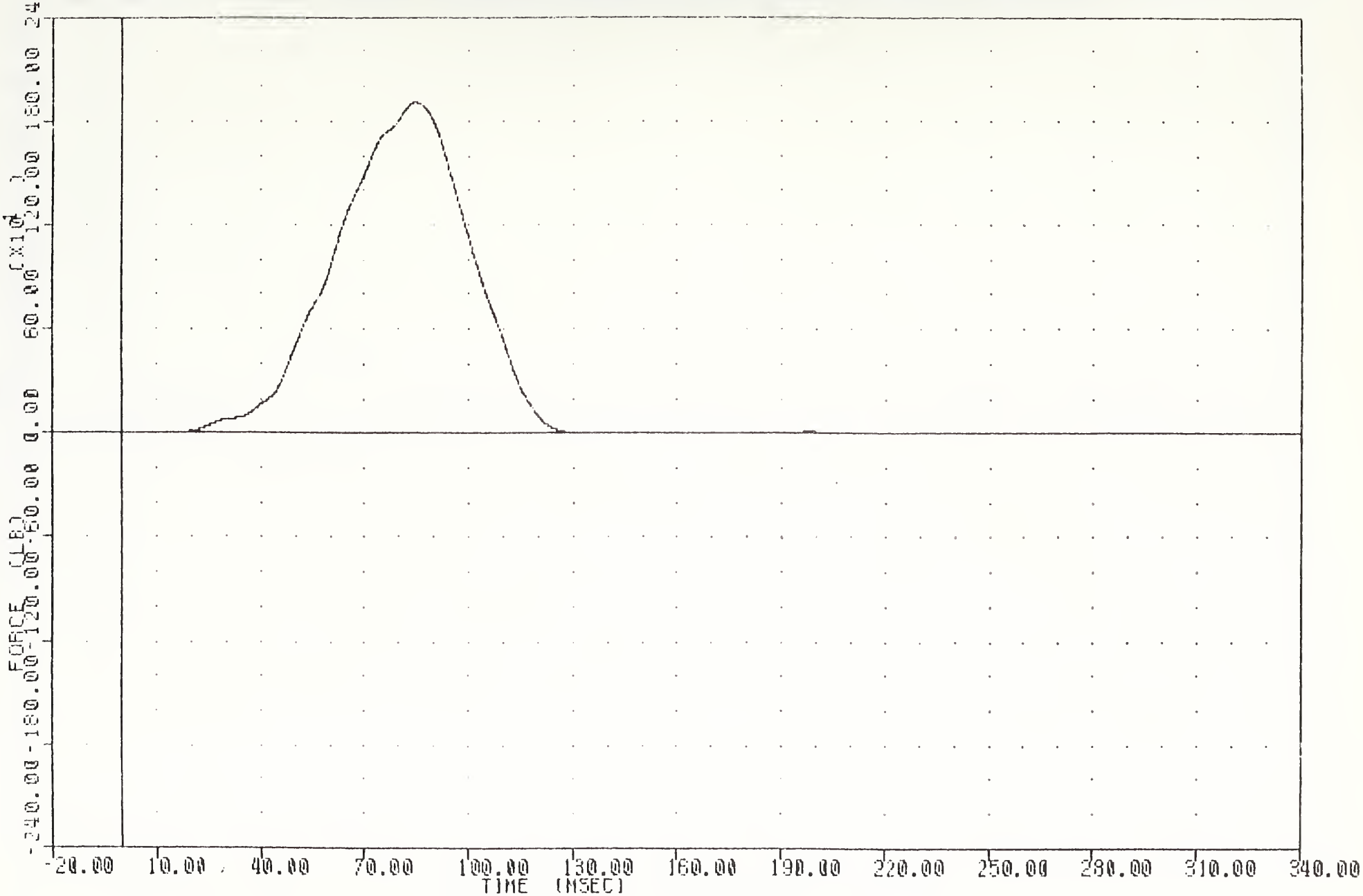
FILTER = BLPP 1000/ 2500/ -16
MIN, MAX VALUES = -479.39@ 104.63 , 118.64 @ 238.13



SUBARU XT INTO FRONTAL BARRIER
PASSENGER RIGHT FEMUR FORCE LBS

IRC , 871013
208 FRONTAL CRASH TEST
87286
SHBF2

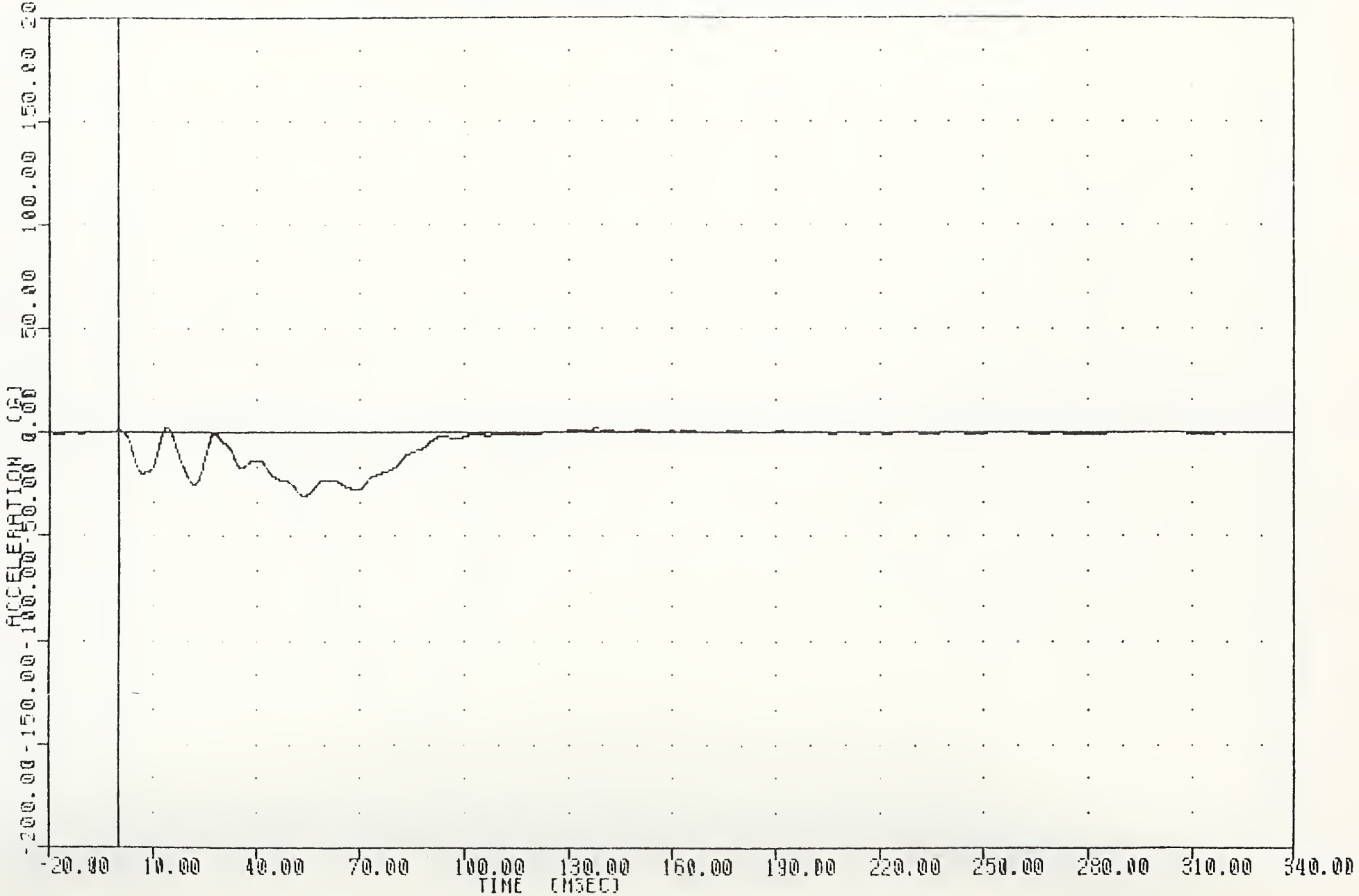
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -2.76 @ 4.88 , 1906.81 @ 84.63



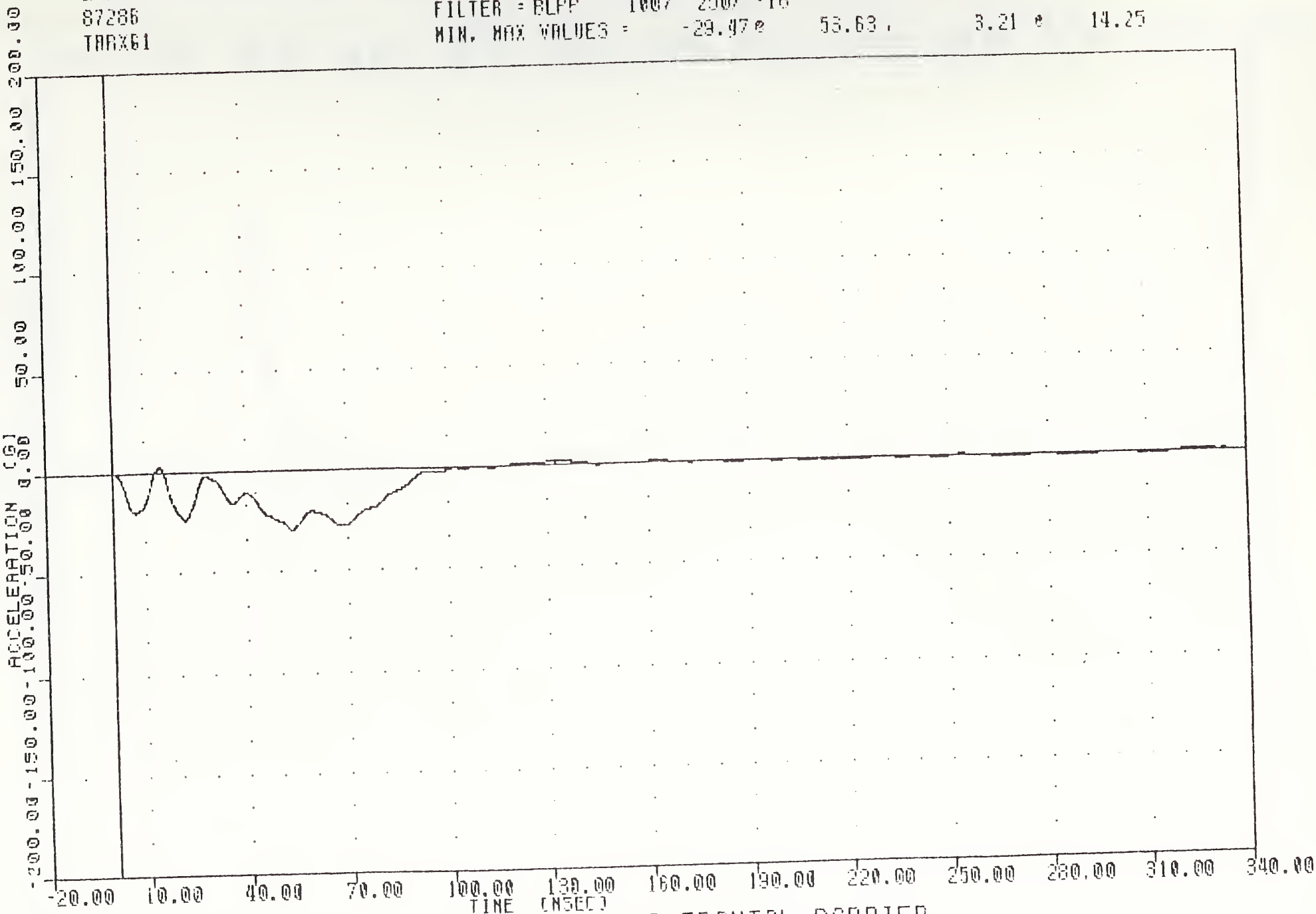
SUBARU XT INTO FRONTAL BARRIER
PASSENGER'S PASSIVE BELT INBOARD FORCE LBS

TRC , 871013
200 FRONTAL CRASH TEST
87286
TLAXGI

FILTER = BLFP 100/ 250/ -16
MIN, MAX VALUES = -30.25@ 51.63 , 2.42 @ 14.00



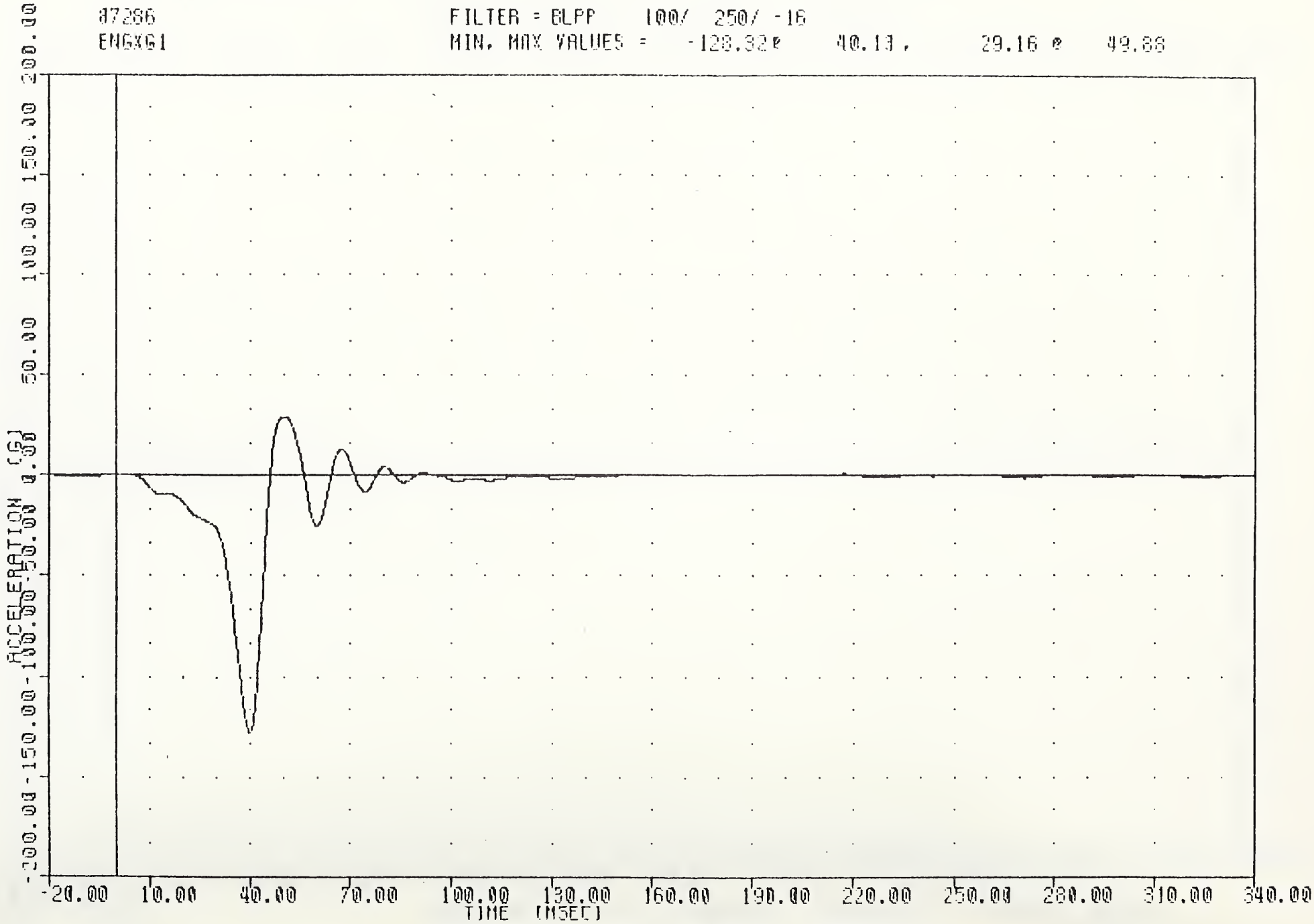
SUBARU XT INTO FRONTAL BARRIER
LEFT REAR SEAT X AXIS ACCELERATION



SUBARU XT INTO FRONTAL BARRIER
RIGHT REAR SEAT X AXIS ACCELERATION

TRC . 871013
200 FRONTAL CRASH TEST
87286
ENGXG1

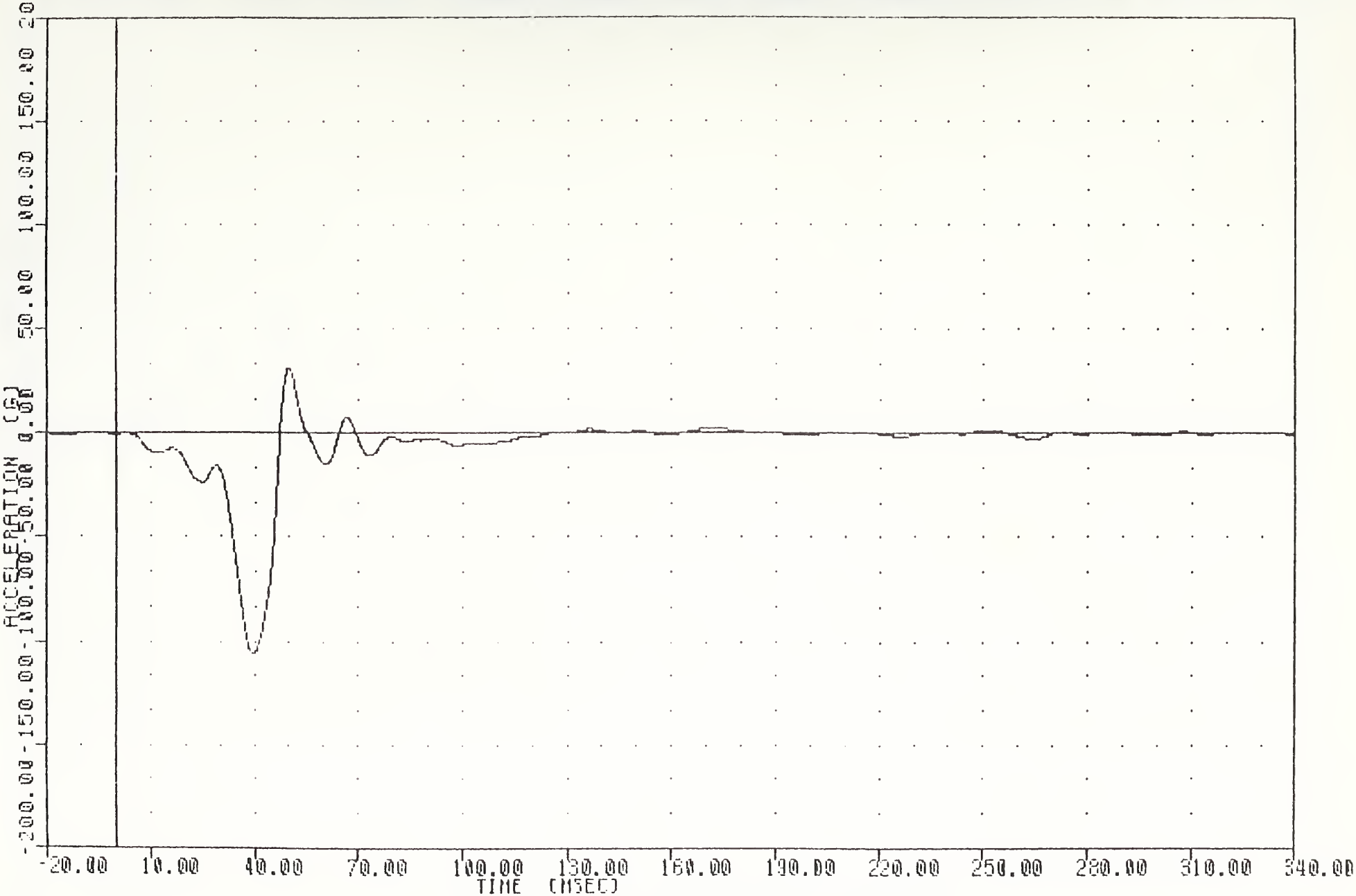
FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -128.32@ 40.13 , 29.16 @ 49.88



SUBARU XT INTO FRONTAL BARRIER
ENGINE UPPER BLOCK X AXIS ACCELERATION

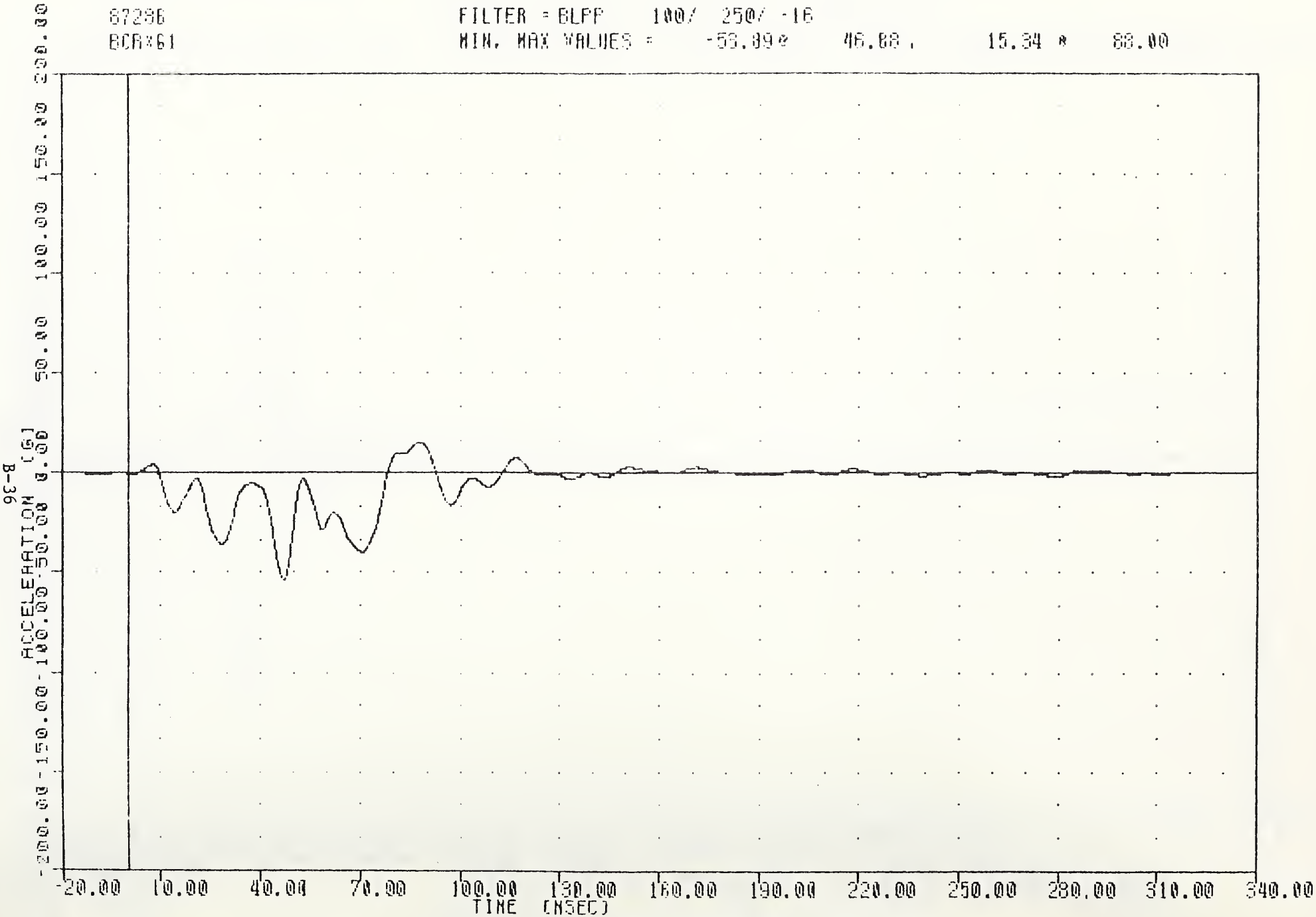
TRC , 871013
200 FRONTAL CRASH TEST
87286
ENG%G2

FILTER = BLPP 100/ 250/ -16
MIN, MAX VALUES = -106.07@ 39.63 , 31.08 @ 49.88

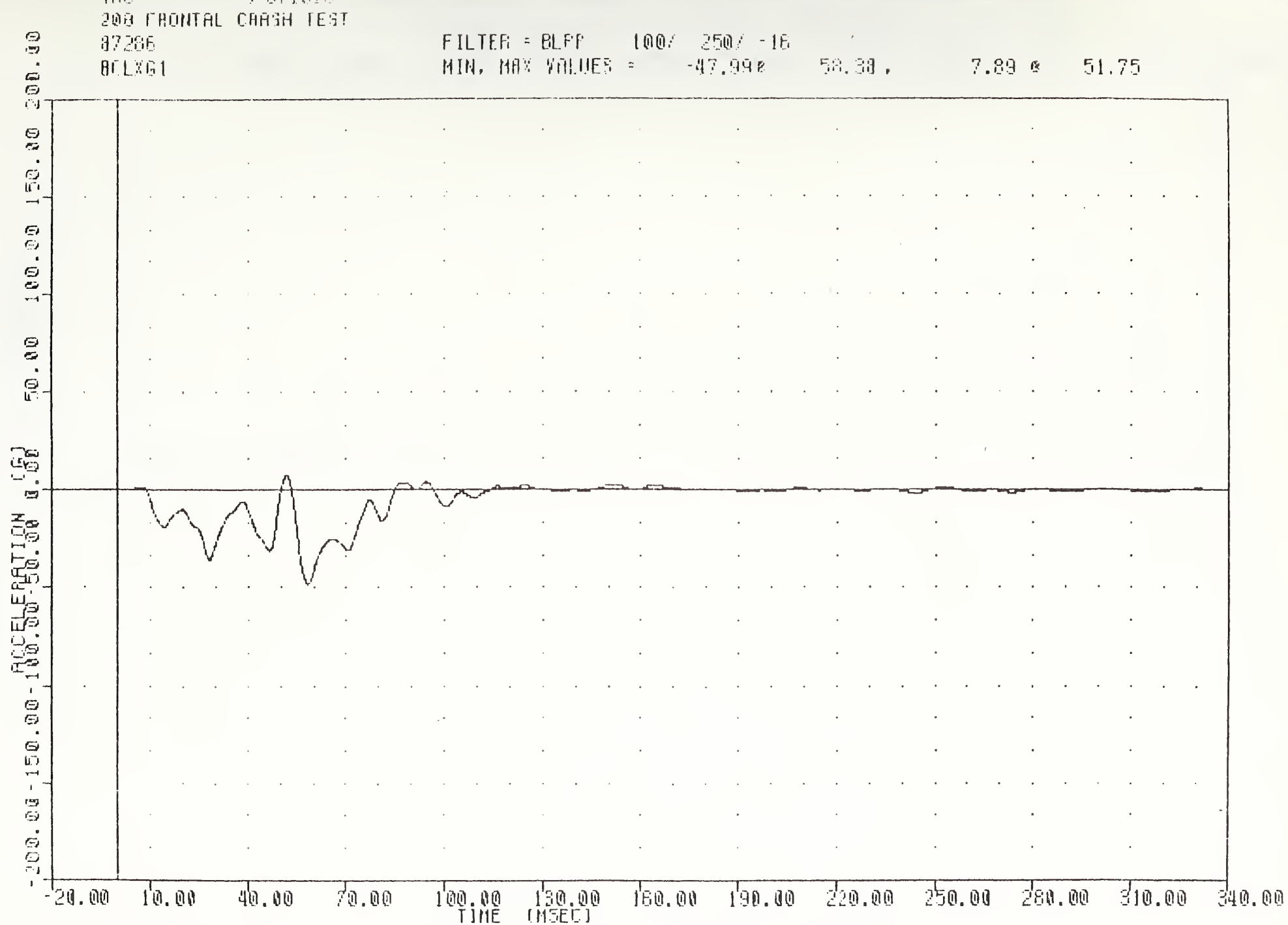


SUBARU XT INTO FRONTAL BARRIER
ENGINE BOTTOM X AXIS ACCELERATION

TAC , 871013
20@ FRONTAL CRASH TEST
87296 FILTER = BLPF 100/ 250/ -16
BCR#61 MIN, MAX VALUES = -53.89@ 46.88 , 15.34 @ 88.00



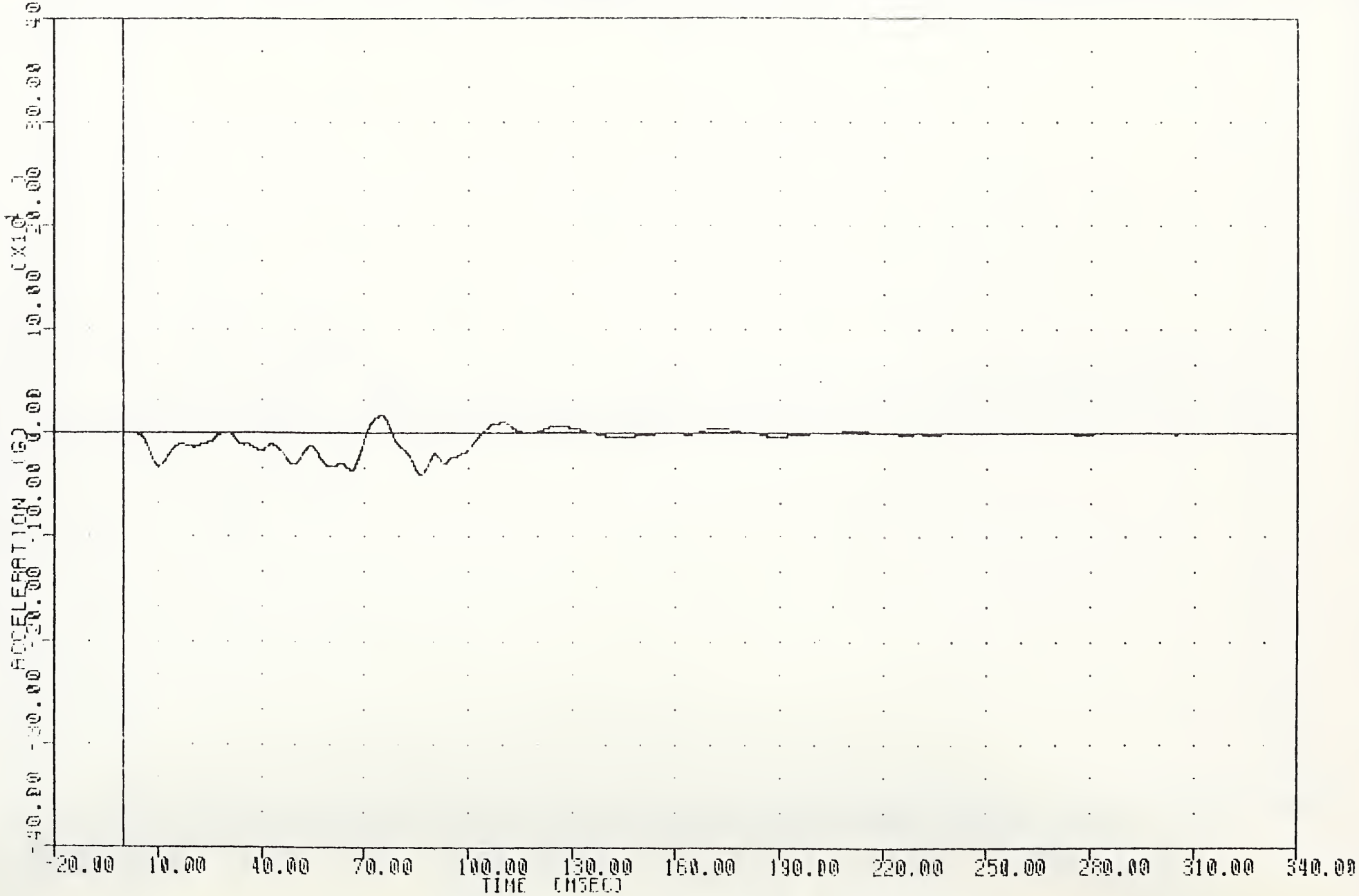
SUBARU XT INTO FRONTAL BARRIER
RIGHT BRAKE CALIPER X AXIS ACCELERATION



SUBARU XT INTO FRONTAL BARRIER
LEFT BRAKE CALIPER X AXIS ACCELERATION

TRC , 871213
20# FRONTAL CRASH TEST
87286
DPCXG1

FILTER = BLFP 100/ 250/ -15
MIN, MAX VALUES = -39.91@ 86.38 , 16.95 @ 75.25



SUBARU XT INTO FRONTAL BARRIER
DASH PANEL CENTER Y AXIS ACCELERATION

APPENDIX C

DUMMY CERTIFICATION INFORMATION

PRE-TEST CALIBRATION

S/N: 45

HYBRID III EXTERIOR DIMENSIONS

Dimensional Symbol	Description	Spec Dimension	Dummy Dimension SN 45
A	Sitting Height (Erect)	34.8 ±.2	34.6
B	Shoulder Pivot Height	20.2 ±.3	20.0
C	"H" Point Height	3.4 ref.	3.4
D	"H" Point Location from Back Line	5.4 ref.	5.4
E	Shoulder Pivot Location from Back Line	3.5 ±.2	3.7
F	Thigh Clearance	5.8 ±.3	5.9
G	Back of Elbow to Wrist Pivot	11.7 ±.3	11.5
H	Occiput to Z-Axis	1.7 ±.1	1.7
I	Shoulder - Elbow Length	13.3 ±.3	13.6
J	Elbow Rest Height	7.9 ±.4	7.7
K	Buttock Knee Length	23.3 ±.5	23.0
L	Popliteal Height	17.4 ±.5	17.5
M	Knee Pivot Height	19.4 ±.3	19.5
N	Buttock Popliteal Length	18.3 ±.5	17.9
O	Chest Depth	8.7 ±.3	8.6
P	Foot Length	10.2 ±.3	10.2
V	Shoulder Breadth	16.9 ±.3	16.8
W	Foot Breadth	3.9 ±.3	3.9
Y	Chest Circumference	38.8 ±.6	38.7
Z	Waist Circumference	33.5 ±.6	33.7
AA	Location for Measurement of Chest Circumference	17.0 ±.1	17.0
BB	Location for Measurement of Waist Circumference	9.0 ±.1	9.0

NOTE: The "H" point is located 1.83 inches forward and 2.57 inches down from the center of the pelvis angle reference hole.

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III

30-OCT-87

VRTC 45C26HD1 HY3 SN45 HEAD DROP CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70.60 DEG. F
RELATIVE HUMIDITY	10% - 70%	28.00 %
PEAK RESULTANT ACCELERATION	225 - 275 G	249.10 G
PEAK LATERAL ACCELERATION	15 G MAX	5.10 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER 30-OCT-87

VRTC 45C26NE1 HY3 SN45 CAL26 NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70.70 DEG. F
RELATIVE HUMIDITY		10% - 70%	33.00 %
IMPACT VELOCITY		19.50 - 20.30 FPS	19.54 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.78 G
	20 MS	14.00 - 19.00 G	17.03 G
	30 MS	11.00 - 16.00 G	13.45 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.15 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.38 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	93.93 DEG.
	TIME	72 - 82 MS	80.63 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-59.0/-39.0 FT.LB	-49.70 FT.LBS
	TIME	65 - 79 MS	71.50 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	167.63 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	142.00 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

3 AXIS NECK TRANSDUCER 30-OCT-87

VRTC 45C26NF1 HY3 SN45 CAL36 NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70.70 DEG. F
RELATIVE HUMIDITY		10% - 70%	33.00 %
IMPACT VELOCITY		22.6 - 23.4 FPS	22.98 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.82 G
	20 MS	17.60 - 22.60 G	17.72 G
	30 MS	12.50 - 18.50 G	13.70 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	20.80 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	41.63 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	73.81 DEG.
	TIME	57 - 64 MS	63.38 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.LBS	76.97 FT.LBS
	TIME	47 - 58 MS	54.63 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	125.13 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	106.75 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III 31-OCT-87

VRTC 45C26TH1 HY3 SN45 CAL 26 H.S.THORAX 01

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71.60 DEG. F
RELATIVE HUMIDITY	10% - 70%	37.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.88 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.88 INCHES *
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1175.8 POUNDS
INTERNAL HYSTERESIS	69% - 85%	73.4%

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III 30-OCT-87

LEFT KNEE
VRTC 45C26LK1 HY3 SN45 L.KNEE 11LB CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70.40 DEG. F
RELATIVE HUMIDITY	10% - 70%	28.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1403.84 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III 30-OCT-87

RIGHT KNEE
VRTC 45C26RK1 HY3 SN45 R.KNEE 11LB CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70.50 DEG. F
RELATIVE HUMIDITY	10% - 70%	28.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1180.71 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleit

PRE-TEST CALIBRATION

S/N: 143

HYBRID III EXTERIOR DIMENSIONS

Dimensional Symbol	Description	Spec Dimension	Dummy Dimension SN 143
A	Sitting Height (Erect)	34.8 ±.2	34.7
B	Shoulder Pivot Height	20.2 ±.3	20.0
C	"H" Point Height	3.4 ref.	3.4
D	"H" Point Location from Back Line	5.4 ref.	5.4
E	Shoulder Pivot Location from Back Line	3.5 ±.2	3.6
F	Thigh Clearance	5.8 ±.3	5.9
G	Back of Elbow to Wrist Pivot	11.7 ±.3	11.6
H	Occiput to Z-Axis	1.7 ±.1	1.7
I	Shoulder - Elbow Length	13.3 ±.3	13.3
J	Elbow Rest Height	7.9 ±.4	8.1
K	Buttock Knee Length	23.3 ±.5	23.0
L	Popliteal Height	17.4 ±.5	17.4
M	Knee Pivot Height	19.4 ±.3	19.5
N	Buttock Popliteal Length	18.3 ±.5	18.0
O	Chest Depth	8.7 ±.3	8.7
P	Foot Length	10.2 ±.3	10.2
V	Shoulder Breadth	16.9 ±.3	16.8
W	Foot Breadth	3.9 ±.3	4.0
Y	Chest Circumference	38.8 ±.6	39.0
Z	Waist Circumference	33.5 ±.6	34.0
AA	Location for Measurement of Chest Circumference	17.0 ±.1	17.0
BB	Location for Measurement of Waist Circumference	9.0 ±.1	9.0

NOTE: The "H" point is located 1.83 inches forward and 2.57 inches down from the center of the pelvis angle reference hole.

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III 30-OCT-87

VRTC 143C2HD1 HY3 SN143 HEAD DROP CAL 2

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70.60 DEG. F
RELATIVE HUMIDITY	10% - 70%	28.00 %
PEAK RESULTANT ACCELERATION	225 - 275 G	253.82 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.01 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER 02-NOV-87

URTC 143C2NE1 HY3 SN143 CAL2 NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	71.40 DEG. F
RELATIVE HUMIDITY		10% - 70%	48.00 %
IMPACT VELOCITY		19.50 - 20.30 FPS	19.50 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.86 G
	20 MS	14.00 - 19.00 G	15.01 G
	30 MS	11.00 - 16.00 G	13.34 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.30 G
DECCLERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.13 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	97.58 DEG.
	TIME	72 - 82 MS	74.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-59.0/-39.0 FT.LB	-58.52 FT.LBS
	TIME	65 - 79 MS	74.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	166.50 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	148.63 MS **

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

3 AXIS NECK TRANSDUCER 31-OCT-87

VRTC 143C2NF1 HY3 SN143 CAL2 NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70.80 DEG. F
RELATIVE HUMIDITY		10% - 70%	36.00 %
IMPACT VELOCITY		22.6 - 23.4 FPS	22.87 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	26.98 G
	20 MS	17.60 - 22.60 G	20.72 G
	30 MS	12.50 - 18.50 G	16.02 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.93 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	35.88 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	76.15 DEG.
	TIME	57 - 64 MS	63.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.LBS	76.15 FT.LBS
	TIME	47 - 58 MS	51.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	119.75 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	104.25 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III 29-OCT-87

VRTC 143C2TH1 HY3 SN143 CAL 2 H.S.THORAX 01

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	70.20 DEG. F
RELATIVE HUMIDITY	10% - 70%	36.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	22.01 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.65 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1116.6 POUNDS
INTERNAL HYSTERESIS	69% - 85%	76.4%

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III 30-OCT-87

LEFT KNEE
VRTC 143C2LK1 HY3 SN143 L.KNEE 11LB CAL 2

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70.50 DEG. F
RELATIVE HUMIDITY	10% - 70%	28.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.96 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1366 LBS.	1243.75 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III 30-OCT-87

RIGHT KNEE
VRTC 143C3RK1 HY3 SN143 R.KNEE 11LB CAL 2

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	70.50 DEG. F
RELATIVE HUMIDITY	10% - 70%	28.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.95 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1271.51 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

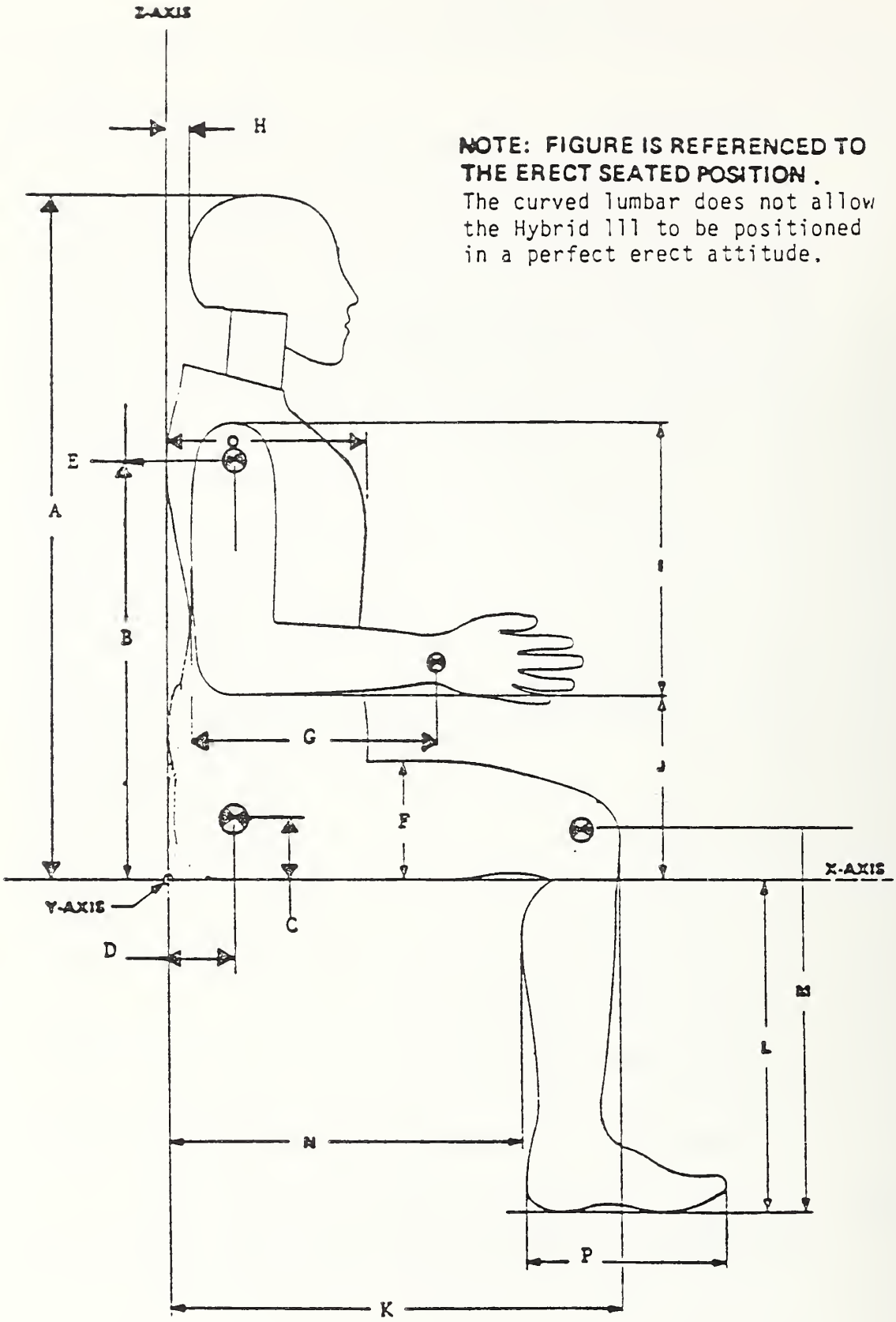
POST-TEST CALIBRATION

S/N:45

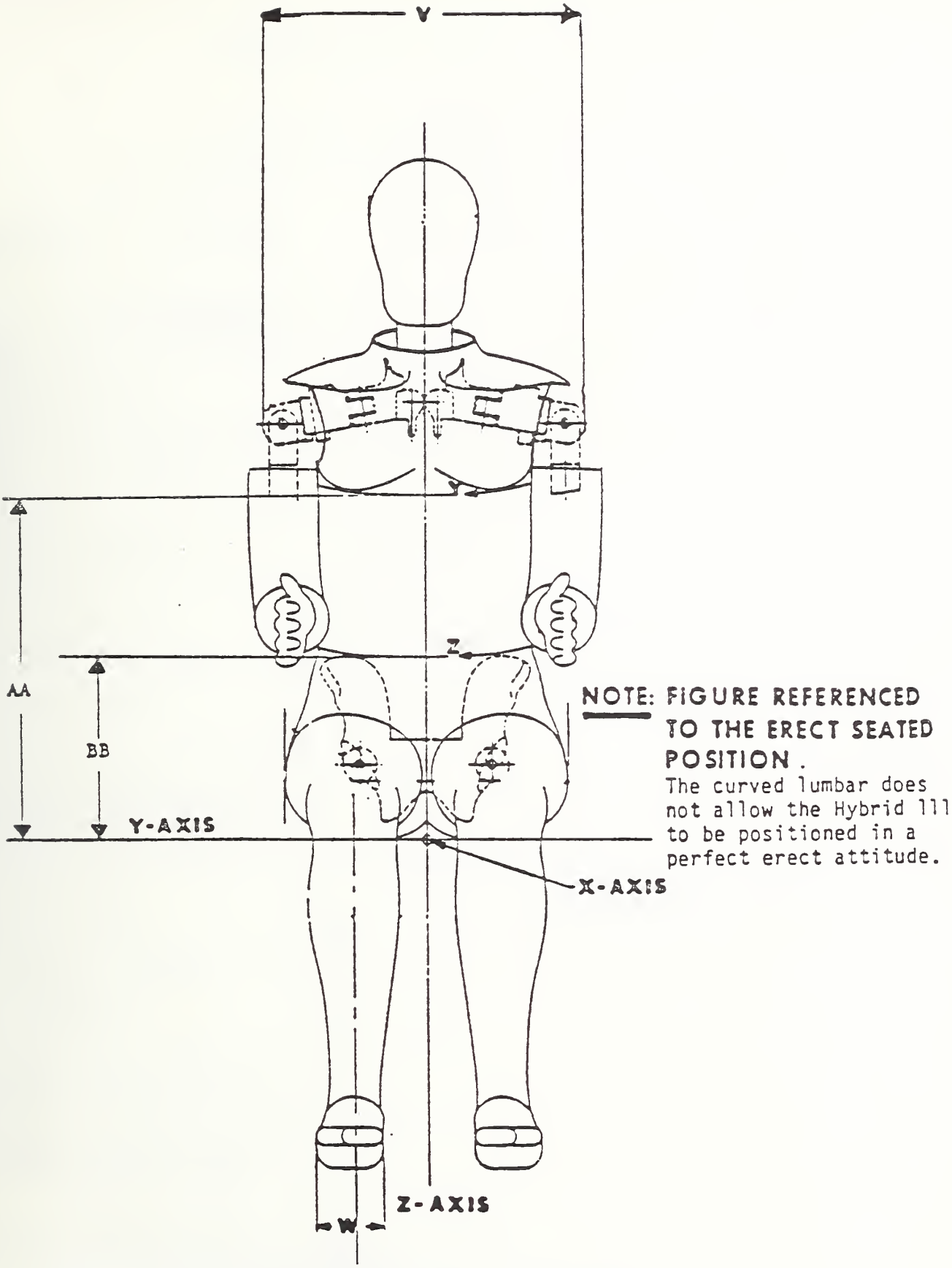
HYBRID III EXTERIOR DIMENSIONS

Dimensional Symbol	Description	Spec Dimension	Dummy Dimension SN 45
A	Sitting Height (Erect)	34.8 ±.2	34.6
B	Shoulder Pivot Height	20.2 ±.3	20.0
C	"H" Point Height	3.4 ref.	3.4
D	"H" Point Location from Back Line	5.4 ref.	5.4
E	Shoulder Pivot Location from Back Line	3.5 ±.2	3.7
F	Thigh Clearance	5.8 ±.3	5.6
G	Back of Elbow to Wrist Pivot	11.7 ±.3	11.4
H	Occiput to Z-Axis	1.7 ±.1	1.7
I	Shoulder - Elbow Length	13.3 ±.3	13.0
J	Elbow Rest Height	7.9 ±.4	7.7
K	Buttock Knee Length	23.3 ±.5	22.7
L	Popliteal Height	17.4 ±.5	17.4
M	Knee Pivot Height	19.4 ±.3	19.6
N	Buttock Popliteal Length	18.3 ±.5	18.5
O	Chest Depth	8.7 ±.3	8.6
P	Foot Length	10.2 ±.3	10.1
V	Shoulder Breadth	16.9 ±.3	16.8
W	Foot Breadth	3.9 ±.3	3.7
Y	Chest Circumference	38.8 ±.6	38.6
Z	Waist Circumference	33.5 ±.6	34.0
AA	Location for Measurement of Chest Circumference	17.0 ±.1	17.0
BB	Location for Measurement of Waist Circumference	9.0 ±.1	9.0

NOTE: The "H" point is located 1.83 inches forward and 2.57 inches down from the center of the pelvis angle reference hole.



HYBRID III Exterior Body Dimensions - Side View



HYBRID III Exterior Body Dimensions - Front View

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III 19-NOV-87

VRTC 45C25HD1 HY3 SN45 HEAD DROP CAL 25

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.70 DEG. F
RELATIVE HUMIDITY	10% - 70%	24.00 %
PEAK RESULTANT ACCELERATION	225 - 275 G	220.17 G *
PEAK LATERAL ACCELERATION	15 G MAX	4.52 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER 19-NOV-87

VRTC 45C25NE1 HY3 SN45 CAL25 NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70.80 DEG. F
RELATIVE HUMIDITY		10% - 70%	22.00 %
IMPACT VELOCITY		19.50 - 20.30 FPS	19.59 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	20.56 G
	20 MS	14.00 - 19.00 G	15.99 G
	30 MS	11.00 - 16.00 G	13.31 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.29 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.63 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	94.05 DEG.
	TIME	72 - 82 MS	80.63 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-59.0/-39.0 FT.LB	-50.10 FT.LBS
	TIME	65 - 79 MS	73.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	165.88 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	141.75 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN V. F. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

6 AXIS NECK TRANSDUCER 19-NOV-87

VRTC 45C25NF1 HY3 SN45 CAL25 NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	70.40 DEG. F
RELATIVE HUMIDITY		10% - 70%	23.00 %
IMPACT VELOCITY		22.6 - 23.4 FPS	22.97 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	25.80 G
	20 MS	17.60 - 22.60 G	19.56 G
	30 MS	12.50 - 18.50 G	14.44 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	14.34 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	41.63 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	74.57 DEG.
	TIME	57 - 64 MS	63.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.LBS	23.73 FT.LBS **
	TIME	47 - 58 MS	35.63 MS **
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	124.00 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	142.13 MS **

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN V. F. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III 19-NOV-87

VRTC 45C25TH1 HY3 SN45 CAL 25 H.S.THORAX 01

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71.00 DEG. F
RELATIVE HUMIDITY	10% - 70%	21.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.84 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.85 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1189.7 POUNDS
INTERNAL HYSTERESIS	69% - 85%	74.2%

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN V. F. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III 19-NOV-87

LEFT KNEE
VRTC 45C25LK1 HY3 SN45 L.KNEE 11LB CAL 25

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.60 DEG. F
RELATIVE HUMIDITY	10% - 70%	24.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.92 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1418.31 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III 19-NOV-87

RIGHT KNEE
VRTC 45C25RK1 HY3 SN45 R.KNEE 11LB CAL 25

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.60 DEG. F
RELATIVE HUMIDITY	10% - 70%	24.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.93 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1380.86 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

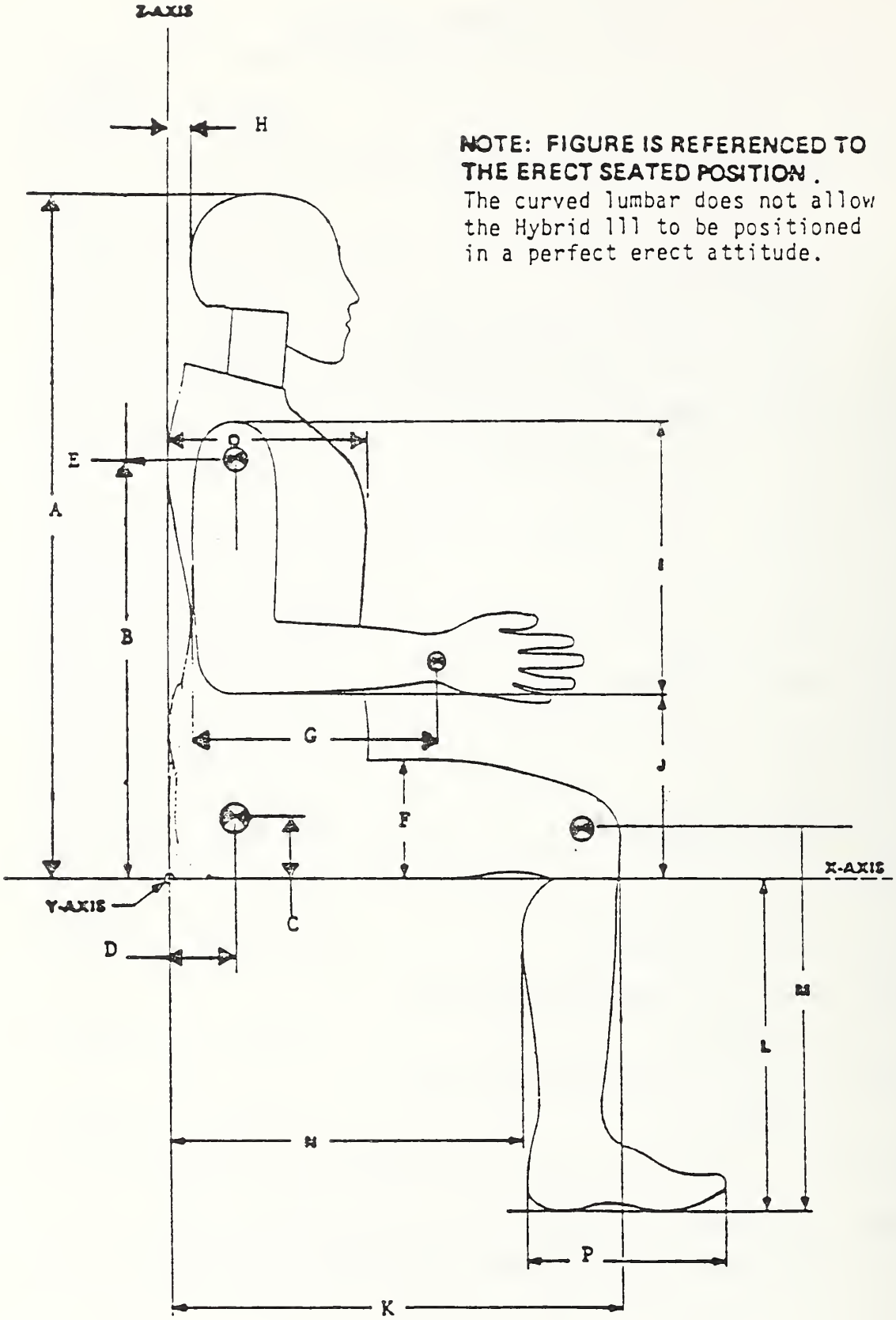
POST-TEST CALIBRATION

S/N: 143

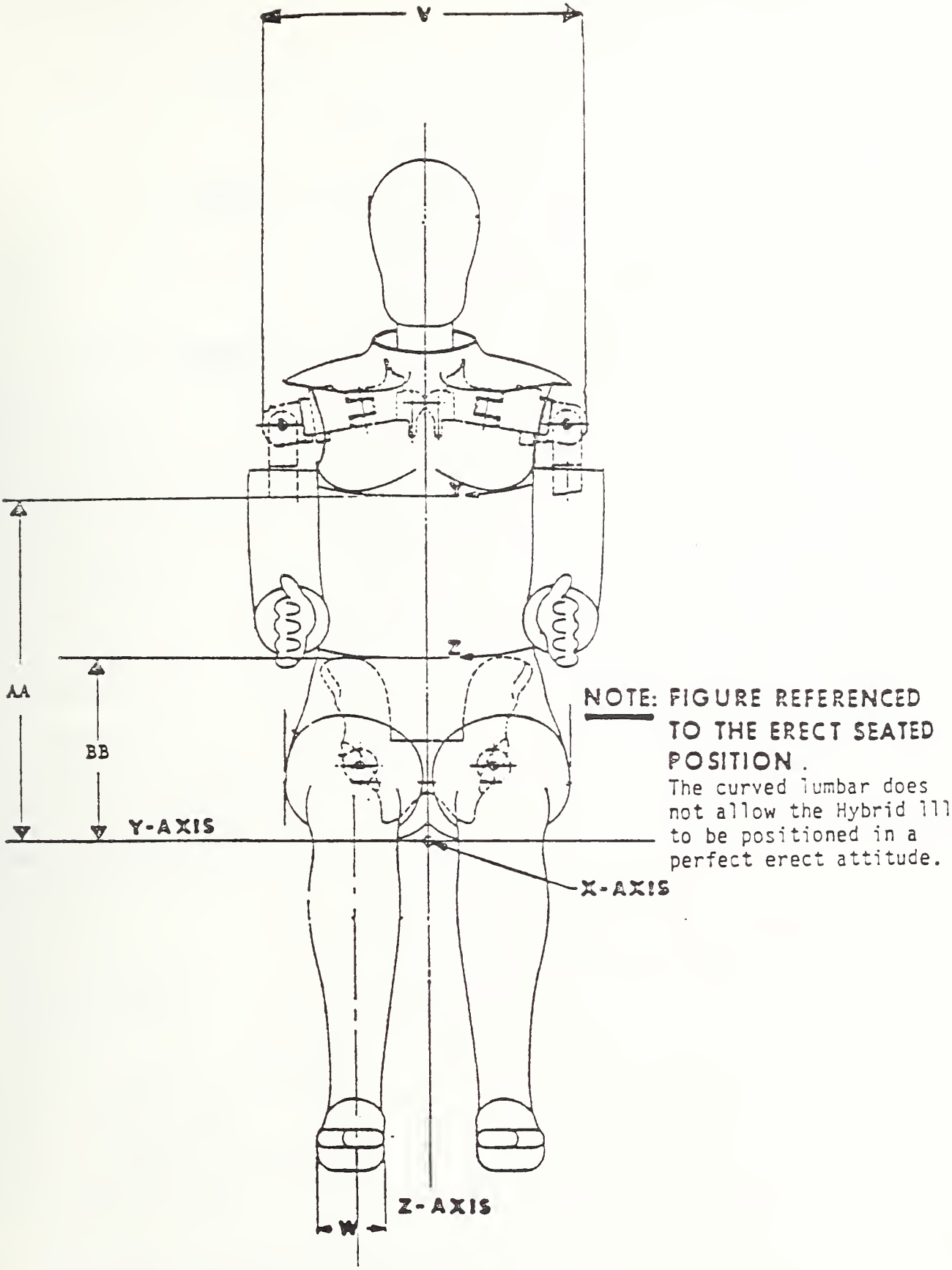
HYBRID III EXTERIOR DIMENSIONS

Dimensional Symbol	Description	Spec Dimension	Dummy Dimension SN 143
A	Sitting Height (Erect)	34.8 ±.2	34.7
B	Shoulder Pivot Height	20.2 ±.3	20.2
C	"H" Point Height	3.4 ref.	3.4
D	"H" Point Location from Back Line	5.4 ref.	5.4
E	Shoulder Pivot Location from Back Line	3.5 ±.2	3.5
F	Thigh Clearance	5.8 ±.3	5.8
G	Back of Elbow to Wrist Pivot	11.7 ±.3	11.5
H	Occiput to Z-Axis	1.7 ±.1	1.7
I	Shoulder - Elbow Length	13.3 ±.3	13.0
J	Elbow Rest Height	7.9 ±.4	8.2
K	Buttock Knee Length	23.3 ±.5	22.9
L	Popliteal Height	17.4 ±.5	17.2
M	Knee Pivot Height	19.4 ±.3	19.2
N	Buttock Popliteal Length	18.3 ±.5	18.6
O	Chest Depth	8.7 ±.3	8.8
P	Foot Length	10.2 ±.3	10.1
V	Shoulder Breadth	16.9 ±.3	16.7
W	Foot Breadth	3.9 ±.3	3.7
Y	Chest Circumference	38.8 ±.6	38.4
Z	Waist Circumference	33.5 ±.6	33.8
AA	Location for Measurement of Chest Circumference	17.0 ±.1	17.0
BB	Location for Measurement of Waist Circumference	9.0 ±.1	9.0

NOTE: The "H" point is located 1.83 inches forward and 2.57 inches down from the center of the pelvis angle reference hole.



HYBRID III Exterior Body Dimensions - Side View



HYBRID III Exterior Body Dimensions - Front View

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

HYBRID III 01-DEC-87

VRTC 143C3HD1 HY3 SN143 HEAD DROP CAL 3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.70 DEG. F
RELATIVE HUMIDITY	10% - 70%	26.00 %
PEAK RESULTANT ACCELERATION	225 - 275 G	254.31 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.57 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK EXTENSION TEST

HYBRID III

3 AXIS NECK TRANSDUCER 02-DEC-87

VRTC 143C3NE1 HY3 SN143 CAL3 NECK EXTENSION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	71.20 DEG. F
RELATIVE HUMIDITY		10% - 70%	27.00 %
IMPACT VELOCITY		19.50 - 20.30 FPS	19.60 FPS
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	20.30 G
	20 MS	14.00 - 19.00 G	15.44 G
	30 MS	11.00 - 16.00 G	13.95 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.91 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.63 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	102.34 DEG.
	TIME	72 - 82 MS	80.25 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-59.0/-39.0 FT.LB	-57.61 FT.LBS
	TIME	65 - 79 MS	74.88 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	165.25 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	146.88 MS

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK FLEXION TEST

HYBRID III

3 AXIS NECK TRANSDUCER 02-DEC-87

VRTC 143C3NF1 HY3 SN143 CAL3 NECK FLEXION

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		69 - 72 DEG. F	71.80 DEG. F
RELATIVE HUMIDITY		10% - 70%	28.00 %
IMPACT VELOCITY		22.6 - 23.4 FPS	23.06 FPS
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	27.84 G **
	20 MS	17.60 - 22.60 G	20.34 G
	30 MS	12.50 - 18.50 G	15.89 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.77 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	35.63 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	75.09 DEG.
	TIME	57 - 64 MS	57.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	65 - 80 FT.LBS	71.99 FT.LBS
	TIME	47 - 58 MS	51.38 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	119.38 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.25 MS

*** TEST DOES NOT MEET SPECIFICATIONS ***

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

HYBRID III 02-DEC-87

VRTC 143C3TH1 HY3 SN143 CAL 3 H.S.THORAX 01

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	69 - 72 DEG. F	71.80 DEG. F
RELATIVE HUMIDITY	10% - 70%	26.00 %
PENDULUM VELOCITY	21.6-22.4 FT/SEC	21.92 FT/SEC
MAXIMUM DEFLECTION	2.50 - 2.86 INCHES	2.81 INCHES
MAXIMUM RESISTIVE FORCE	1080 - 1245 POUNDS	1227.0 POUNDS
INTERNAL HYSTERESIS	69% - 85%	73.3%

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

HYBRID III 01-DEC-87

LEFT KNEE
VRTC 143C3LK1 HY3 SN143 L.KNEE 11LB CAL 3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.60 DEG. F
RELATIVE HUMIDITY	10% - 70%	26.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1159.47 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

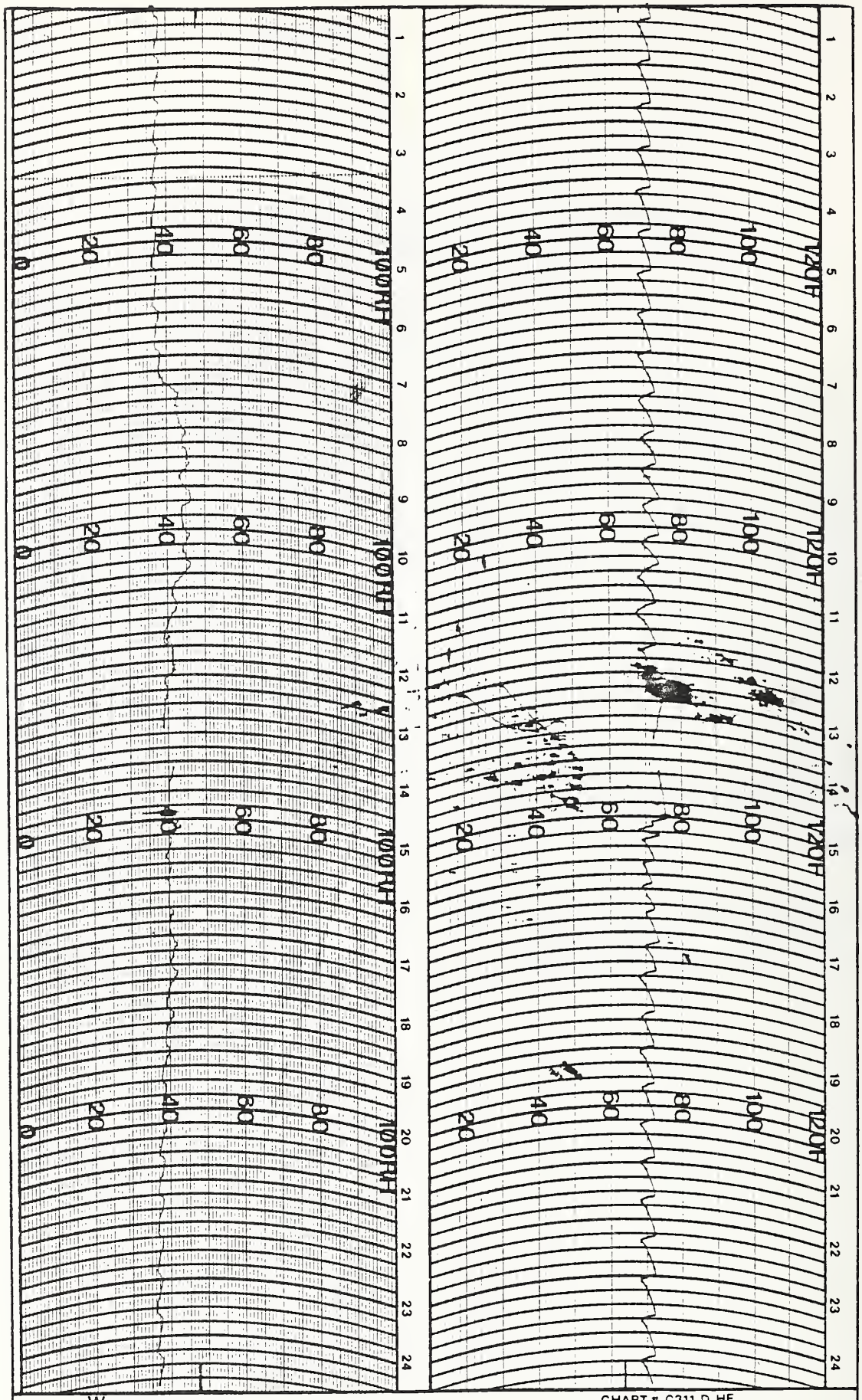
HYBRID III 01-DEC-87

RIGHT KNEE
VRTC 143C3RK1 HY3 SN143 R.KNEE 11LB CAL 3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78 DEG. F	71.70 DEG. F
RELATIVE HUMIDITY	10% - 70%	26.00 %
PROBE VELOCITY	6.8 - 7.0 FT/SEC	6.91 FT/SEC
PEAK KNEE IMPACT FORCE	996 - 1566 LBS.	1139.25 LBS.
PROBE WEIGHT	11.0 LBS.	

DUMMY COMPONENT MEETS SPECIFICATIONS

TECHNICIAN Chas. Middlet



WEATHER MEASURE
P.O. BOX 41257
SACRAMENTO, CA. 95841
PHONE (916)481-7565

HYGROTHERMOGRAPH
1 DAY

CHART = C311 D HF
PART = 699123

STATION Toyota Camry DATE ON 11/2/87 DATE OFF 11/3/87

TL 242 .S2667

Sankey, J.

Vehicle barr
testing on

Form DOT F 17
FORMERLY FORM D

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